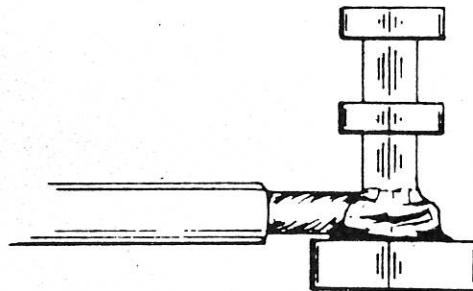
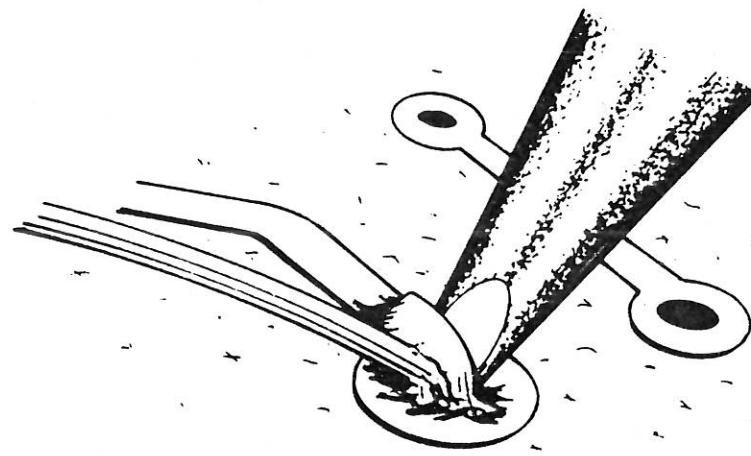
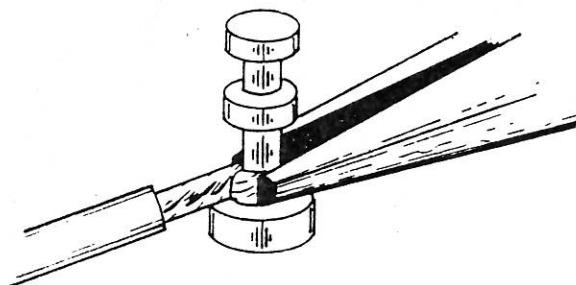


# **Wiring & Soldering Handbook**

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OMNI TRAINING CORP

***Wiring & Soldering***  
**Handbook**

**The STANDARD**  
**of the Industry**



THIS TRAINING HANDBOOK HAS BEEN DESIGNED TO PROVIDE YOU WITH STEP BY STEP DIRECTIONS ON HOW TO EFFECTIVELY ASSEMBLE, SOLDER AND INSPECT ELECTRONIC EQUIPMENT. TRAINING WILL PROMOTE PRODUCTIVITY, PRODUCT QUALITY AND MINIMIZE REWORK AND MATERIAL SCRAP.

I HEAR . . . . . AND I FORGET.  
I SEE . . . . . AND I REMEMBER.  
I DO . . . . . AND I UNDERSTAND.

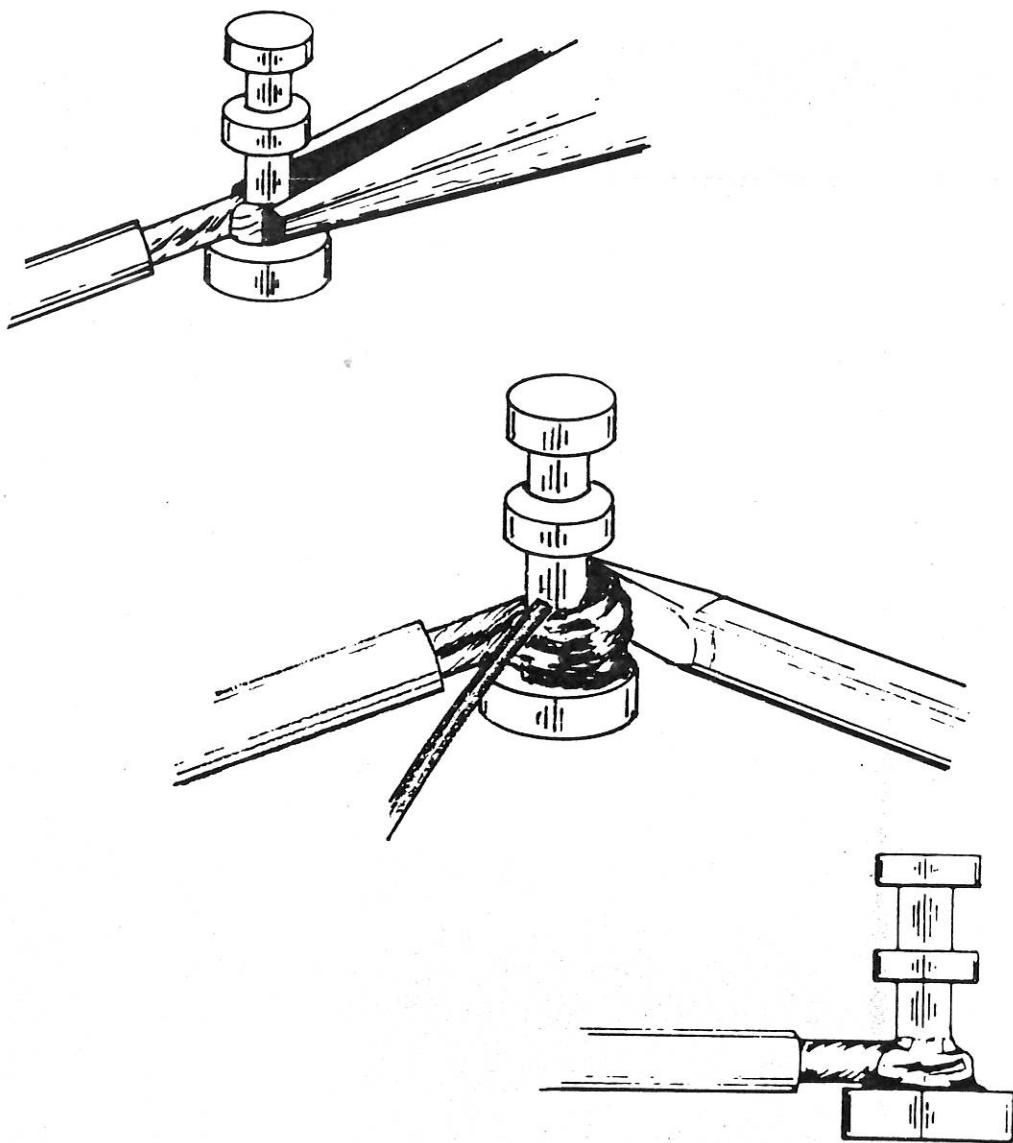
YOUR DEDICATION AND APPLICATION TO THIS TRAINING COURSE WILL DETERMINE THE QUALITY OF THE PRODUCT YOUR COMPANY MANUFACTURES.

YOUR COMPANY IS TRAINING YOU BECAUSE THEY ARE AWARE THAT "PEOPLE ARE A COMPANY'S GREATEST RESOURCE."



# **Wiring & Soldering Handbook**

## **TURRET TERMINALS**



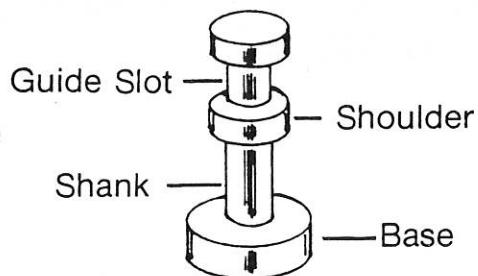
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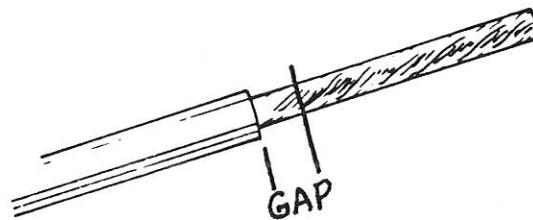
# WIRING & SOLDERING TURRET TERMINALS

## TURRET TERMINAL DESCRIPTION



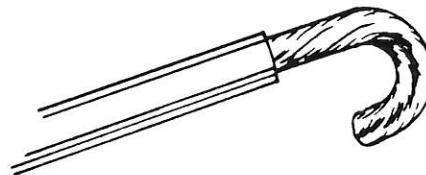
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SELECT A WIRE WHICH HAS BEEN  
PROPERLY STRIPPED, TWISTED AND  
TINNED.



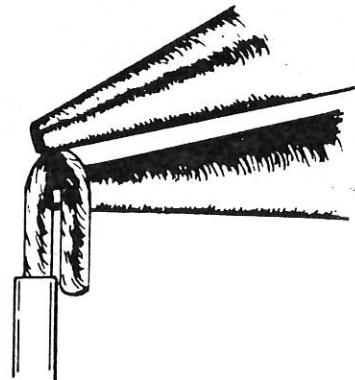
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PREFORM THE WIRE TO A HOOK  
CONFIGURATION

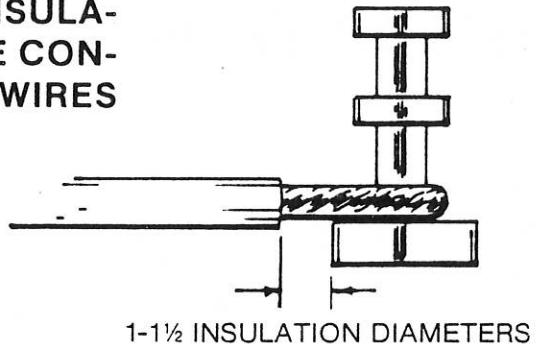


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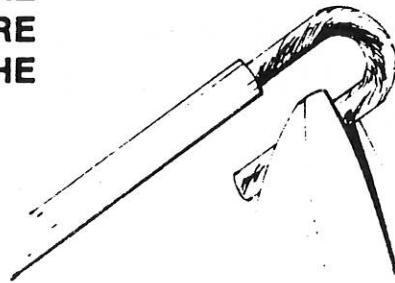
SHAPE THE WIRE AROUND THE  
BLADES OF ROUND NOSE PLIERS. DO  
NOT DAMAGE THE WIRE STRANDS  
DURING THE OPERATION.



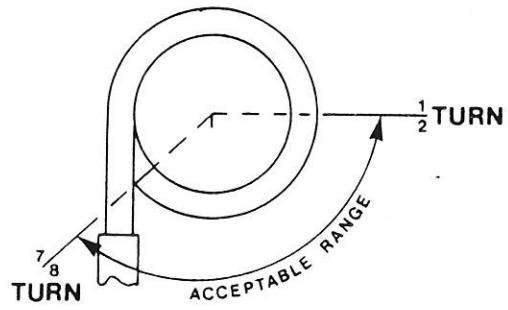
ALLOW FOR PROPER INSULATION CLEARANCE OF 1 TO 1½ INSULATION DIAMETERS. THIS PREVENTS INSULATION FROM MELTING INTO THE CONNECTION OR ADJACENT BARE WIRES FROM SHORTING.



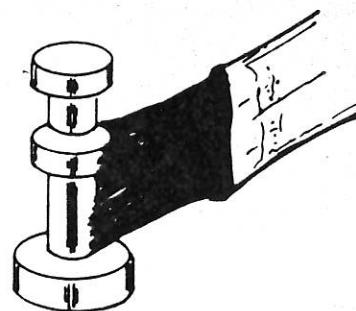
CUT OFF EXCESSIVE WIRE WITH WIRE CUTTERS, ALLOWING ENOUGH WIRE FOR A PROPER WRAP AROUND THE TERMINAL SHANK.



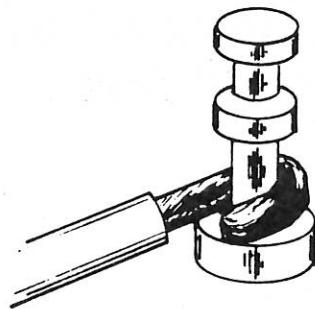
THE ACCEPTABLE RANGE FOR WIRE TERMINATION IS FROM 1/2 TURN MINIMUM TO 7/8 TURN MAXIMUM.



PRIOR TO INSTALLING THE WIRE, CLEAN THE TERMINAL WITH AN APPROVED SOLVENT AND BRISTLE BRUSH TO REMOVE CONTAMINANTS DEPOSITED DURING STORAGE OR HANDLING.

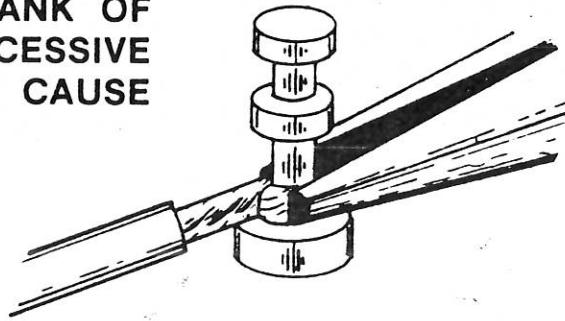


PLACE PREPARED WIRE INTO POSITION ON THE TERMINAL.



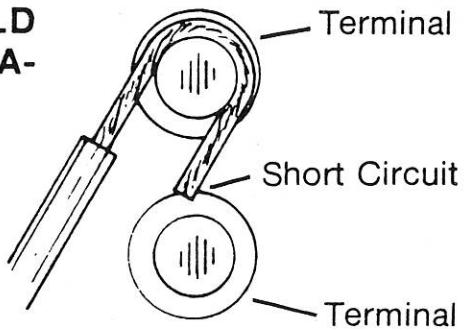
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USING LONG NOSE PLIERS, GENTLY SQUEEZE LOOSE END OF WIRE TIGHTLY AGAINST THE SHANK OF THE TERMINAL. AVOID EXCESSIVE PRESSURE WHICH WOULD CAUSE DAMAGE TO WIRE STRANDS.



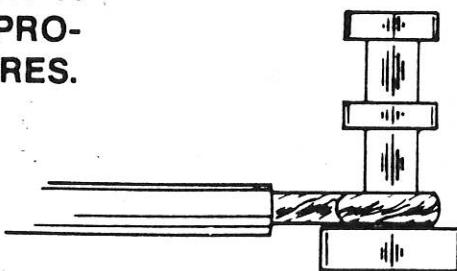
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THE END OF THE WIRE MUST BE CONTAINED WITHIN THE BASE AREA AS PROJECTING WIRE ENDS COULD CAUSE SHORTING BETWEEN ADJACENT TERMINALS.

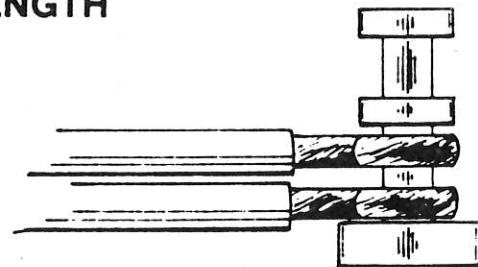


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THE WIRE SHOULD BE FLAT TO THE BASE OF THE TERMINAL FOR THE ENTIRE WRAP. THIS ALLOWS FOR A RELIABLE CONNECTION, AND PROVIDES ROOM FOR ADDITIONAL WIRES.

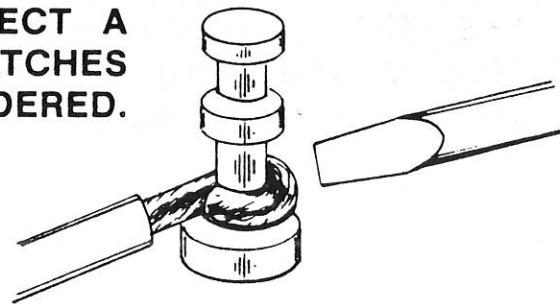


WHEN INSTALLING MULTIPLE WIRES ON A TERMINAL, ALL WIRES SHOULD BE PARALLEL TO THE BASE. INSULATION CLEARANCE AND WRAP LENGTH SHOULD BE THE SAME.



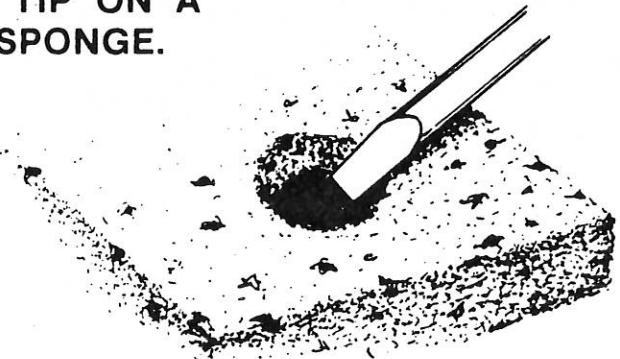
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WITH WIRE OR WIRES PROPERLY IN POSITION THE CONNECTION IS READY TO BE SOLDERED. TO SOLDER SAFELY AND QUICKLY, SELECT A SOLDERING IRON TIP THAT MATCHES THE CONNECTION TO BE SOLDERED.



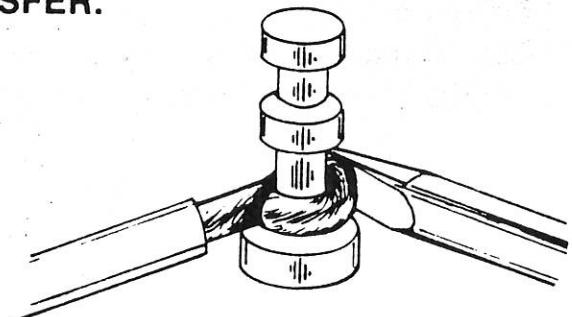
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REMOVE THE SOLDERING IRON FROM HOLDER, AND WIPE THE TIP ON A CLEAN, WET, CELLULOSE SPONGE.

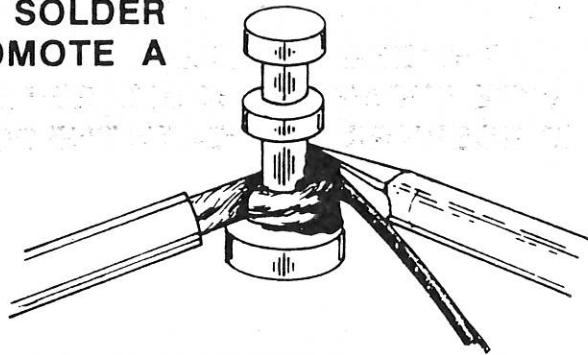


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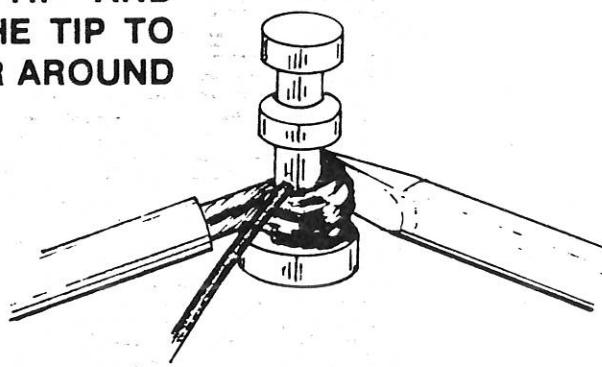
PLACE THE TIP ON THE CONNECTION WITH MAXIMUM CONTACT TO ACHIEVE A RAPID HEAT TRANSFER.



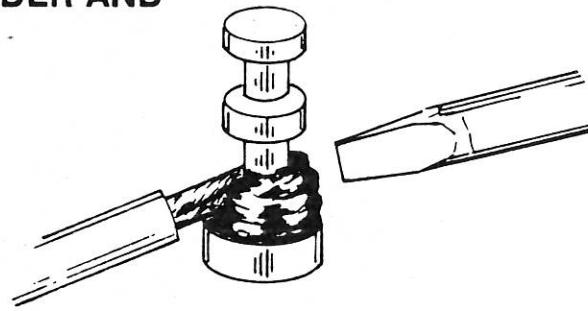
MELT A SMALL AMOUNT OF SOLDER AT THE JUNCTION OF THE TIP AND THE WORK TO FORM A SOLDER BRIDGE, WHICH WILL PROMOTE A RAPID HEAT TRANSFER.



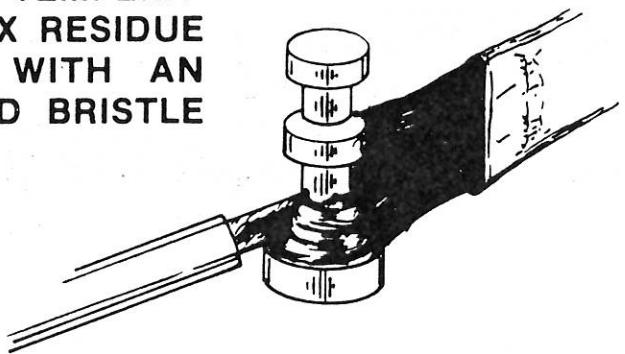
THEN, IMMEDIATELY PLACE THE SOLDER OPPOSITE THE TIP AND ALLOW THE HEAT FROM THE TIP TO DRAW THE MOLTEN SOLDER AROUND THE TERMINAL.



AS SOON AS THE SOLDER HAS FORMED A CONTINUOUS FILLET AROUND THE TERMINAL, REMOVE THE SOLDER AND TIP FROM THE TERMINAL.



ALLOW THE CONNECTION TO SOLIDIFY AND COOL TO ROOM TEMPERATURE. REMOVE THE FLUX RESIDUE FROM THE TERMINAL WITH AN APPROVED SOLVENT AND BRISTLE BRUSH.



THE COMPLETED CONNECTION SHOULD BE SMOOTH, BRIGHT, AND SHINY, WITH THE SOLDER FLOWING TO THE EDGE OF THE TERMINAL. THE WIRE STRANDS SHOULD BE READILY DISCERNIBLE BEHIND THE SOLDER.



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BY FOLLOWING THESE STEP-BY-STEP INSTRUCTIONS, YOU SHOULD BE ABLE TO CONSISTENTLY PRODUCE ACCEPTABLE CONNECTIONS. INSPECTION CRITERIA HAS BEEN PROVIDED WHICH ALLOWS YOU TO COMPARE YOUR WORKMANSHIP WITH INDUSTRY STANDARDS. THE CONNECTION ON THE LEFT SHOWS MINIMUM SOLDER, CENTER CONNECTION HAS THE OPTIMUM AMOUNT, AND THE RIGHT CONNECTION HAS THE MAXIMUM AMOUNT.

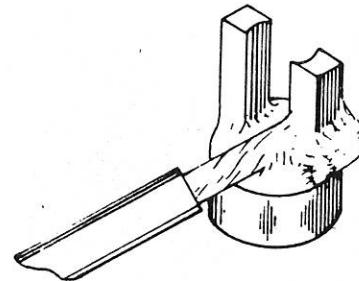
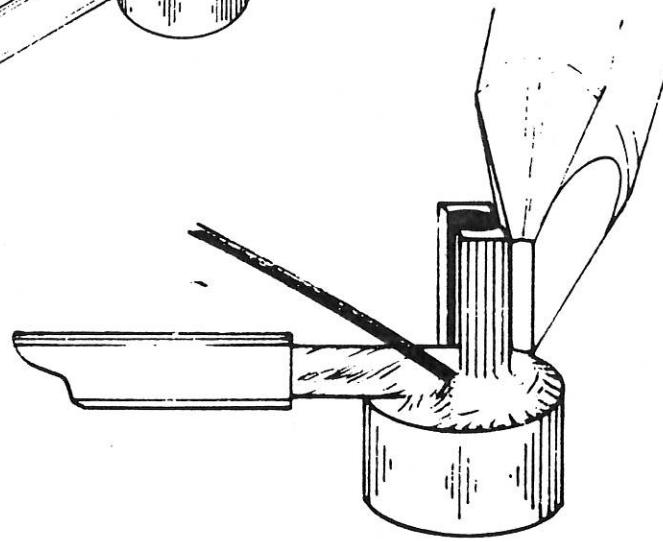
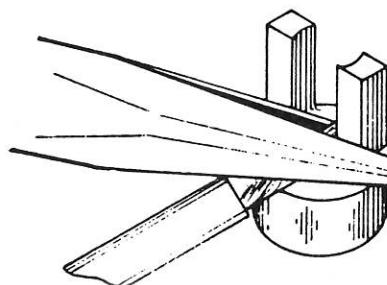


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YOUR DEDICATION TO QUALITY WORKMANSHIP REFLECTS THE QUALITY OF THE PRODUCTS YOUR COMPANY MANUFACTURES.

# **Wiring & Soldering Handbook**

## **BIFURCATED TERMINALS**



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## NOTES



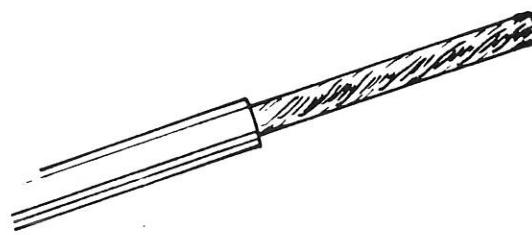
# WIRING & SOLDERING BIFURCATED TERMINALS

ASSORTMENT OF BIFURCATED  
TERMINALS



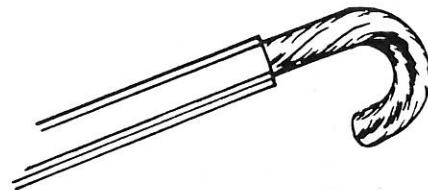
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SELECT A WIRE WHICH HAS BEEN  
PROPERLY STRIPPED, TWISTED, AND  
TINNED.



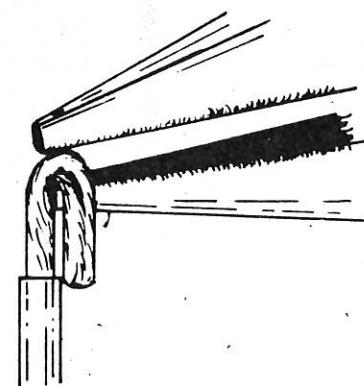
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PREFORM THE WIRE TO A HOOK  
CONFIGURATION.

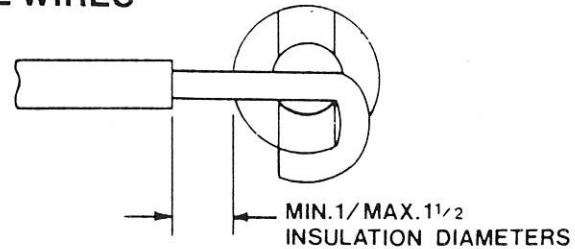


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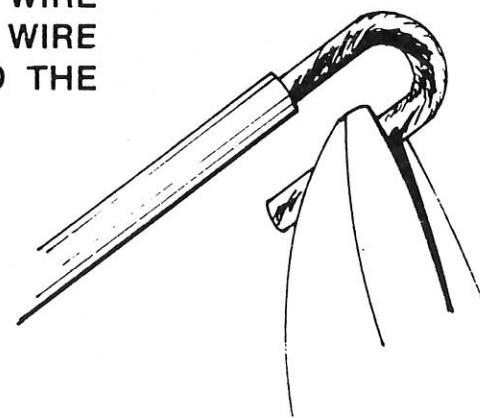
SHAPE THE WIRE AROUND THE  
BLADES OF ROUND NOSE PLIERS. DO  
NOT DAMAGE THE WIRE STRANDS  
DURING THE OPERATION.



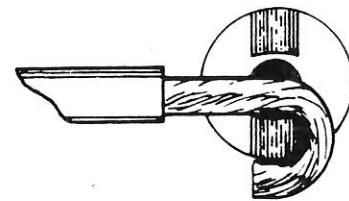
ALLOW FOR PROPER INSULATION CLEARANCE OF 1 TO 1½ INSULATION DIAMETERS. THIS PREVENTS INSULATIONS FROM MELTING INTO THE CONNECTIONS OR ADJACENT BARE WIRES FROM SHORTING.



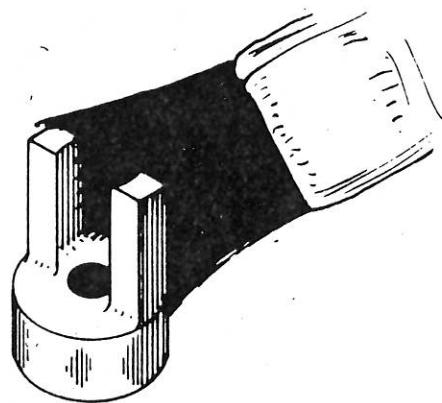
CUT OFF EXCESSIVE WIRE WITH WIRE CUTTERS, ALLOWING ENOUGH WIRE FOR A PROPER WRAP AROUND THE TERMINAL.



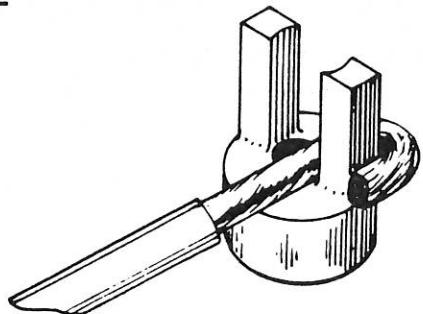
THE ACCEPTABLE WIRE WRAP IS FOR THE WIRE TO HAVE A DOUBLE 90° BEND AND THE END OF THE WIRE CUT OFF FLUSH WITH THE FRONT FACE OF THE VERTICAL POST.



PRIOR TO INSTALLING THE WIRE, CLEAN THE TERMINAL WITH AN APPROVED SOLVENT AND BRISTLE BRUSH TO REMOVE CONTAMINATES DEPOSITED DURING STORAGE OR HANDLING.

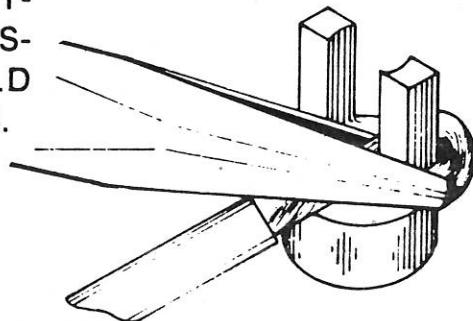


POSITION THE FORMED WIRE OVER EITHER OF THE POSTS ON THE TERMINAL.



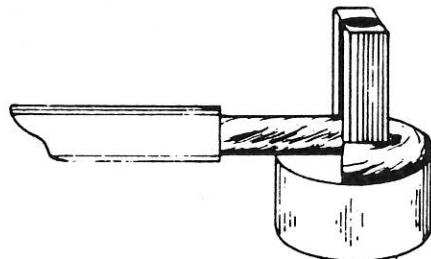
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USING LONG NOSE PLIERS, GENTLY SQUEEZE THE WIRE TIGHTLY AGAINST BOTH THE INSIDE AND OUTSIDE OF THE TERMINAL. AVOID EXCESSIVE PRESSURE WHICH WOULD CAUSE DAMAGE TO WIRE STRANDS.



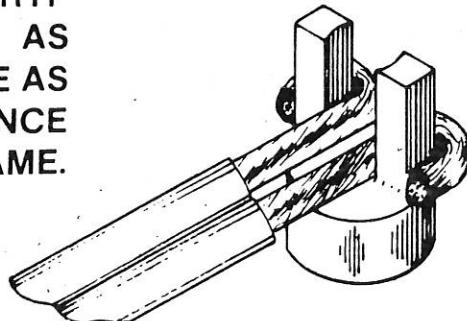
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IT IS IMPORTANT THAT THE WIRE BE FLAT TO, AND IN CONTACT WITH, THE TOP OF THE TERMINAL BASE FOR THE ENTIRE LENGTH OF THE WRAP.

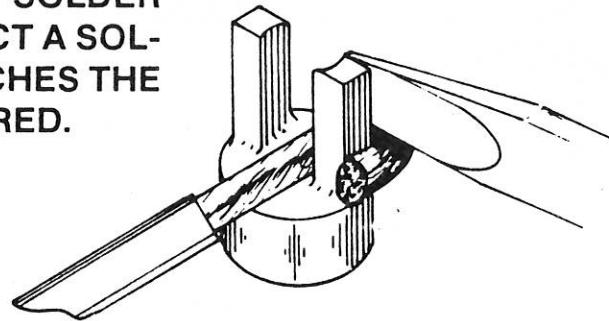


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ADDITIONAL WIRES SHALL BE WRAPPED TO ALTERNATING VERTICAL POSTS AND BE WRAPPED AS CLOSE TO THE PRECEDING WIRE AS POSSIBLE. INSULATION CLEARANCE OF ALL WIRES SHOULD BE THE SAME.

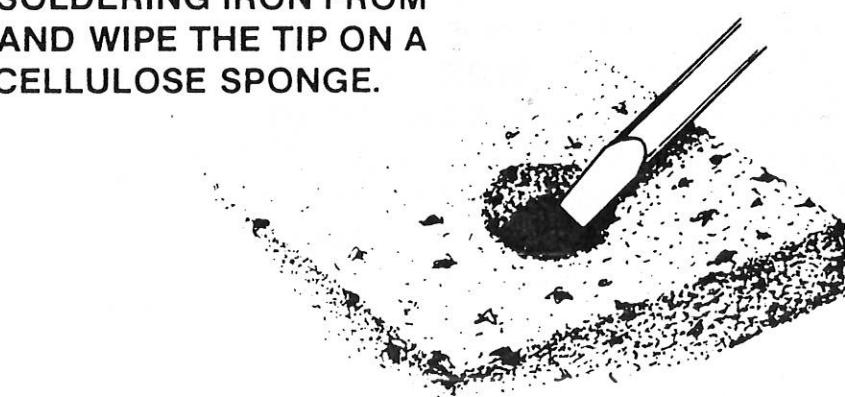


WITH WIRE OR WIRES PROPERLY IN POSITION, THE CONNECTION IS READY TO BE SOLDERED. TO SOLDER SAFELY AND QUICKLY, SELECT A SOLDERING IRON TIP THAT MATCHES THE CONNECTION TO BE SOLDERED.



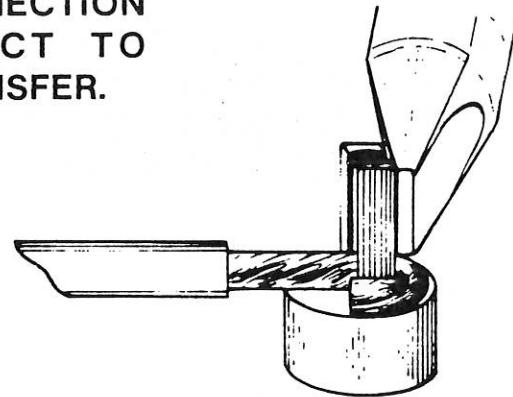
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REMOVE THE SOLDERING IRON FROM THE HOLDER AND WIPE THE TIP ON A CLEAN, WET, CELLULOSE SPONGE.



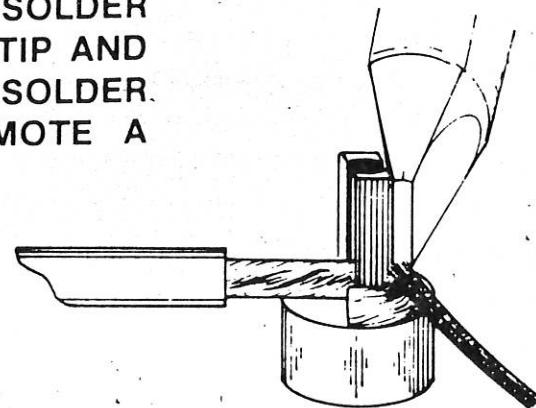
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PLACE THE TIP ON THE CONNECTION WITH MAXIMUM CONTACT TO ACHIEVE A RAPID HEAT TRANSFER.

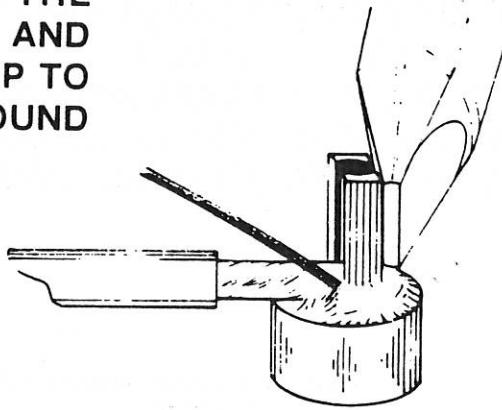


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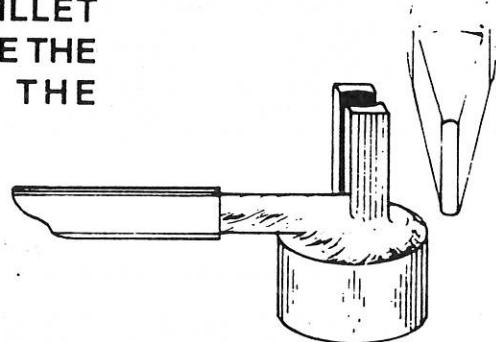
MELT A SMALL AMOUNT OF SOLDER AT THE JUNCTION OF THE TIP AND THE WORK TO FORM A SOLDER BRIDGE WHICH WILL PROMOTE A RAPID HEAT TRANSFER.



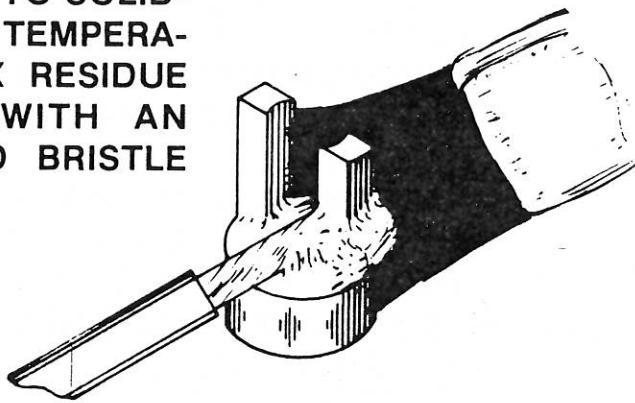
THEN IMMEDIATELY PLACE THE SOLDER OPPOSITE THE TIP AND ALLOW THE HEAT FROM THE TIP TO DRAW THE MOLTEN SOLDER AROUND THE TERMINAL.



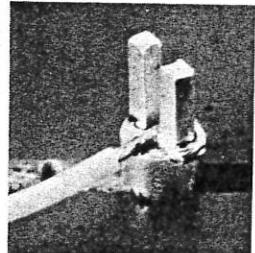
AS SOON AS THE SOLDER HAS FORMED A CONTINUOUS FILLET AROUND THE TERMINAL, REMOVE THE SOLDER AND TIP FROM THE TERMINAL.



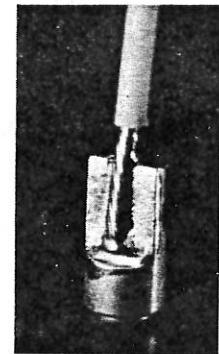
ALLOW THE CONNECTION TO SOLIDIFY AND COOL TO ROOM TEMPERATURE. REMOVE THE FLUX RESIDUE FROM THE TERMINAL WITH AN APPROVED SOLVENT AND BRISTLE BRUSH.



THE COMPLETED CONNECTION SHOULD BE SMOOTH, BRIGHT, AND SHINY, WITH THE SOLDER FLOWING TO THE EDGE OF THE TERMINAL. THE WIRE STRANDS SHOULD BE READILY DISCERNIBLE BENEATH THE SOLDER.

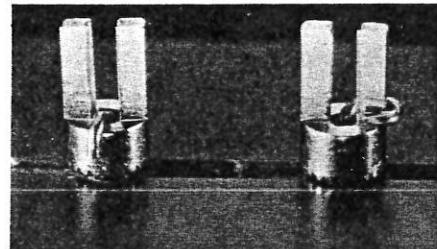


THERE ARE TWO OTHER ALTERNATE METHODS OF ATTACHING WIRES TO BIFURCATED TERMINALS. THE TOP ROUTE WHERE THE WIRE APPROACHES FROM ABOVE AND IS SOLDERED BETWEEN THE TWO VERTICAL POSTS.



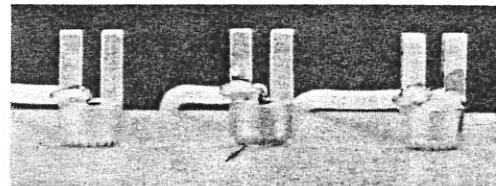
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THE BOTTOM ROUTE WHERE THE WIRE APPROACHES FROM THE SIDE OF THE ASSEMBLY OPPOSITE THE TERMINAL, RUNS THROUGH THE HOLE, AND IS WRAPPED AND SOLDERED TO EITHER THE BASE OR VERTICAL POST.



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BY FOLLOWING THESE STEP-BY-STEP INSTRUCTIONS, YOU SHOULD BE ABLE TO CONSISTENTLY PRODUCE ACCEPTABLE CONNECTIONS. INSPECTION CRITERIA HAS BEEN PROVIDED WHICH ALLOWS YOU TO COMPARE YOUR WORKMANSHIP WITH INDUSTRY STANDARDS. THE CONNECTION ON THE LEFT SHOWS MINIMUM SOLDER, CENTER CONNECTION HAS THE OPTIMUM AMOUNT, AND THE RIGHT CONNECTION HAS THE MAXIMUM AMOUNT.



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YOUR DEDICATION TO QUALITY WORKMANSHIP REFLECTS THE QUALITY OF THE PRODUCTS YOUR COMPANY MANUFACTURES.

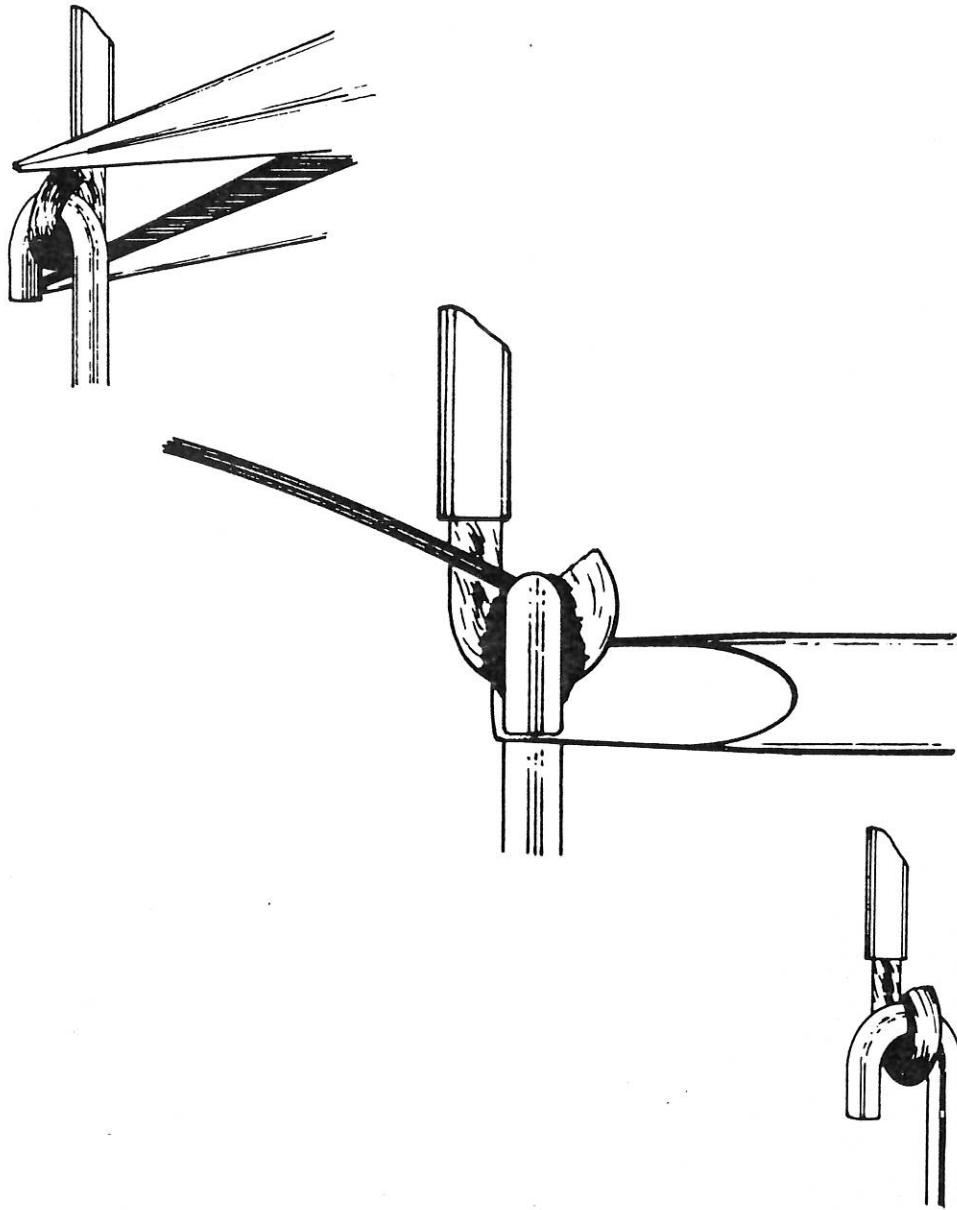
## **NOTES**

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# **Wiring & Soldering Handbook**

## **HOOK TERMINALS**



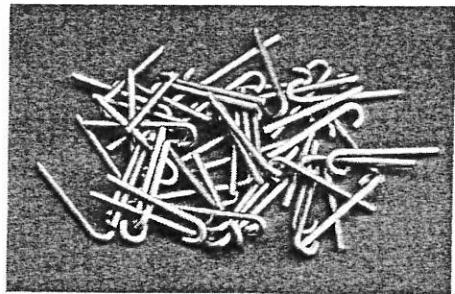
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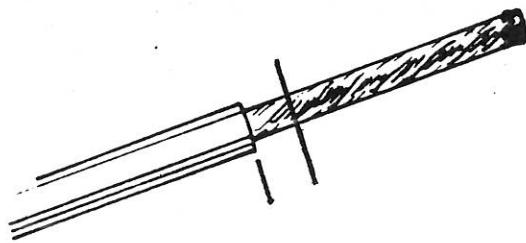
# WIRING & SOLDERING HOOK TERMINALS

ASSORTMENT OF HOOK TERMINALS



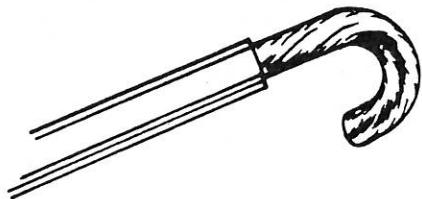
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SELECT A WIRE WHICH HAS BEEN  
PROPERLY STRIPPED, TWISTED, AND  
TINNED.



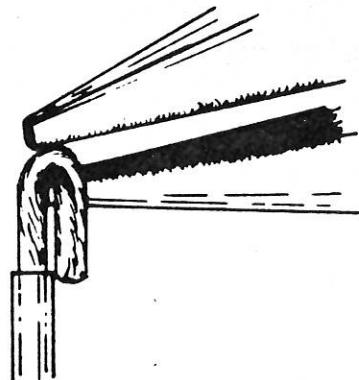
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PREFORM THE WIRE TO A HOOK  
CONFIGURATION.



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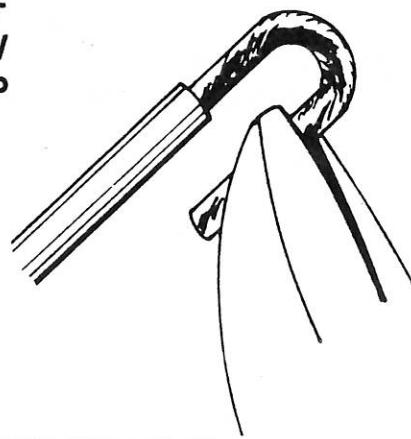
SHAPE THE WIRE AROUND THE  
BLADES OF ROUND NOSE PLIERS. DO  
NOT DAMAGE THE WIRE STRANDS  
DURING THE OPERATION.



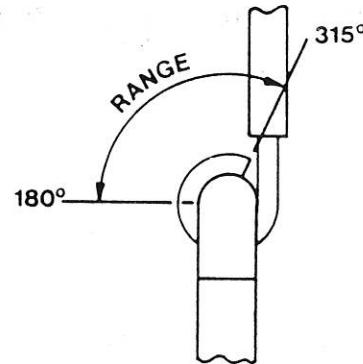
ALLOW FOR PROPER INSULATION CLEARANCE OF 1 TO 1½ INSULATION DIAMETERS. THIS PREVENTS INSULATIONS FROM MELTING INTO THE CONNECTIONS OR ADJACENT BARE WIRES FROM SHORTING.



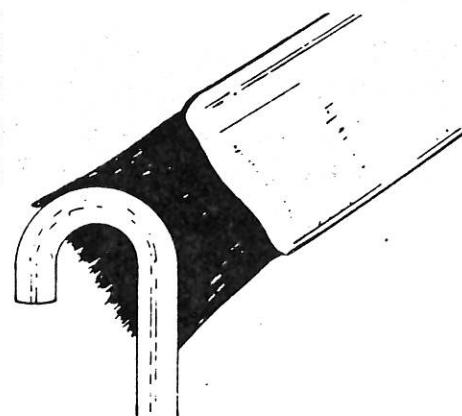
USING WIRE CUTTERS, CUT OFF EXCESSIVE WIRE LENGTH. ALLOW ENOUGH WIRE FOR A PROPER WRAP AROUND THE TERMINAL.



THE WIRE OR WIRES MAY APPROACH THE TERMINAL FROM ANY DIRECTION, MUST PASS THROUGH THE EYE, AND FROM THE POINT WHERE THE WIRE FIRST TOUCHES THE TERMINAL, MUST BE WRAPPED A MINIMUM OF  $\frac{1}{2}$  TURN TO A MAXIMUM OF  $\frac{7}{8}$  TURN.



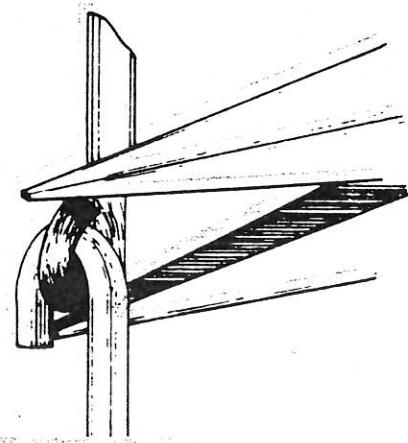
PRIOR TO INSTALLING THE WIRE, CLEAN THE TERMINAL WITH AN APPROVED SOLVENT AND BRISTLE BRUSH TO REMOVE CONTAMINATES DEPOSITED DURING STORAGE OR HANDLING.



**PLACE PREPARED WIRE INTO POSITION ON THE TERMINAL.**



**USING LONG NOSE PLIERS, GENTLY SQUEEZE LOOSE END OF WIRE TIGHTLY AGAINST THE TERMINAL. AVOID EXCESSIVE PRESSURE WHICH WOULD CAUSE DAMAGE TO WIRE STRANDS.**



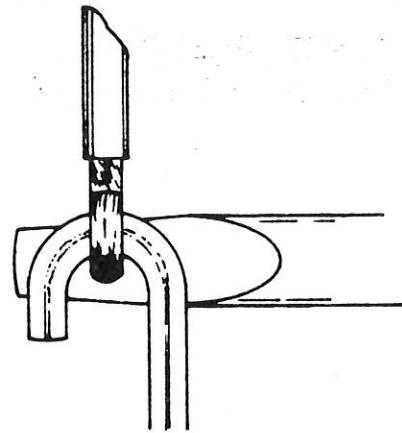
**THE WIRE SHOULD BE STRAIGHT AND TIGHT ON THE TERMINAL FOR THE ENTIRE WRAP. THIS ALLOWS FOR A RELIABLE CONNECTION, AND PROVIDES ROOM FOR ADDITIONAL WIRES.**



**ADDITIONAL WIRES MAY BE WRAPPED IN THE SAME OR OPPOSING DIRECTION AS THE FIRST. THEY SHOULD BE WRAPPED AS CLOSE AS POSSIBLE TO THE PRECEDING WIRE. INSULATION CLEARANCE AND WRAP LENGTH SHOULD BE THE SAME.**

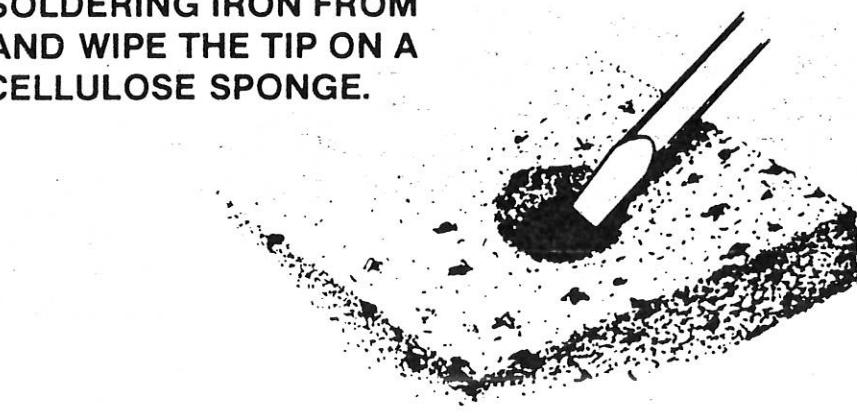


WITH WIRE OR WIRES PROPERLY IN POSITION, THE CONNECTION IS READY TO BE SOLDERED. TO SOLDER SAFELY AND QUICKLY, SELECT A SOLDERING IRON TIP THAT MATCHES THE CONNECTION TO BE SOLDERED.



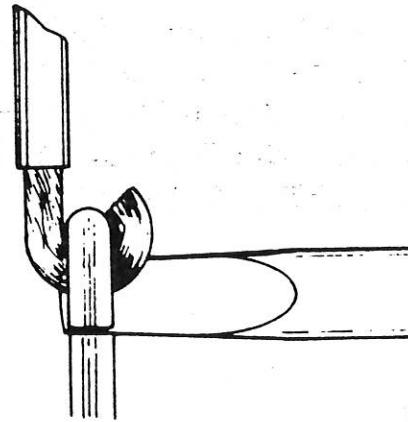
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REMOVE THE SOLDERING IRON FROM THE HOLDER AND WIPE THE TIP ON A CLEAN, WET, CELLULOSE SPONGE.



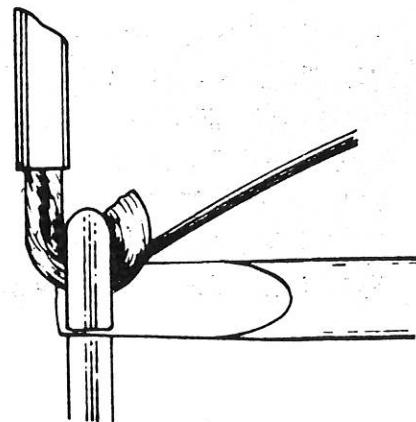
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PLACE THE TIP ON THE CONNECTION WITH MAXIMUM CONTACT TO ACHIEVE A RAPID HEAT TRANSFER.

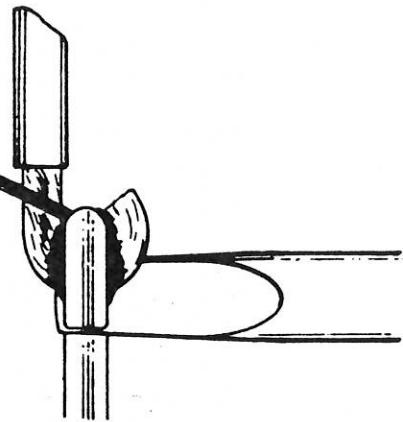


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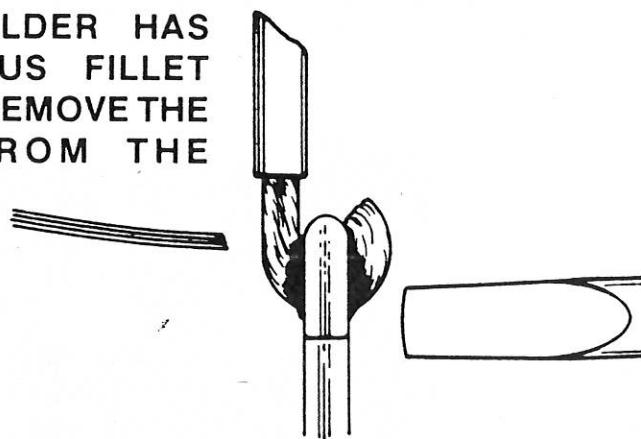
MELT A SMALL AMOUNT OF SOLDER AT THE JUNCTION OF THE TIP AND THE WORK TO FORM A SOLDER BRIDGE, WHICH WILL PROMOTE A RAPID HEAT TRANSFER.



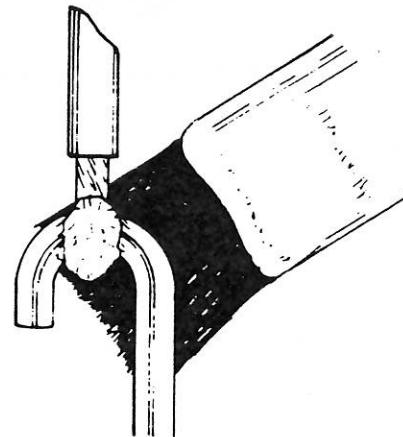
THEN IMMEDIATELY PLACE THE SOLDER OPPOSITE THE TIP AND ALLOW THE HEAT FROM THE TIP TO DRAW THE MOLTEN SOLDER AROUND THE TERMINAL.



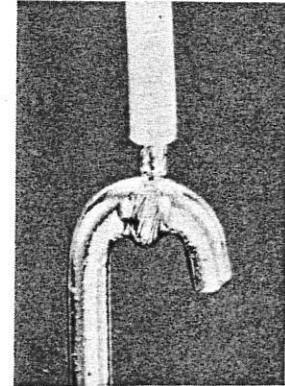
AS SOON AS THE SOLDER HAS FORMED A CONTINUOUS FILLET AROUND THE TERMINAL, REMOVE THE SOLDER AND TIP FROM THE TERMINAL.



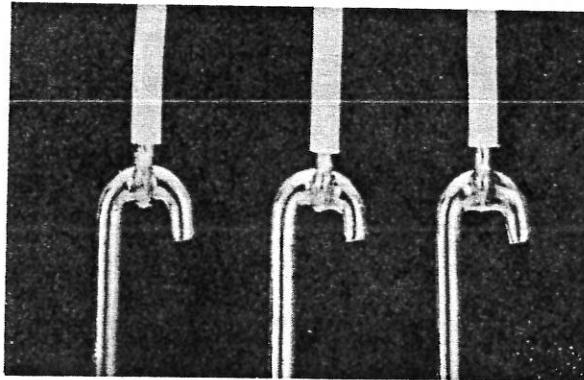
ALLOW THE CONNECTION TO SOLIDIFY AND COOL TO ROOM TEMPERATURE. REMOVE THE FLUX RESIDUE FROM THE TERMINAL WITH AN APPROVED SOLVENT AND BRISTLE BRUSH.



THE COMPLETED CONNECTION SHOULD BE SMOOTH, BRIGHT, AND SHINY, WITH THE SOLDER FLOWING AND WETTING TO THE TERMINAL. THE WIRE STRANDS SHOULD BE READILY DISCERNIBLE BENEATH THE SOLDER.



BY FOLLOWING THESE STEP-BY-STEP INSTRUCTIONS, YOU SHOULD BE ABLE TO CONSISTENTLY PRODUCE ACCEPTABLE CONNECTIONS. INSPECTION CRITERIA HAS BEEN PROVIDED WHICH ALLOWS YOU TO COMPARE YOUR WORKMANSHIP WITH INDUSTRY STANDARDS. THE CONNECTION ON THE LEFT SHOWS MINIMUM SOLDER, CENTER CONNECTION HAS THE OPTIMUM AMOUNT, AND THE RIGHT CONNECTION HAS THE MAXIMUM AMOUNT.



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YOUR DEDICATION TO QUALITY WORKMANSHIP REFLECTS THE QUALITY OF THE PRODUCTS YOUR COMPANY MANUFACTURES.

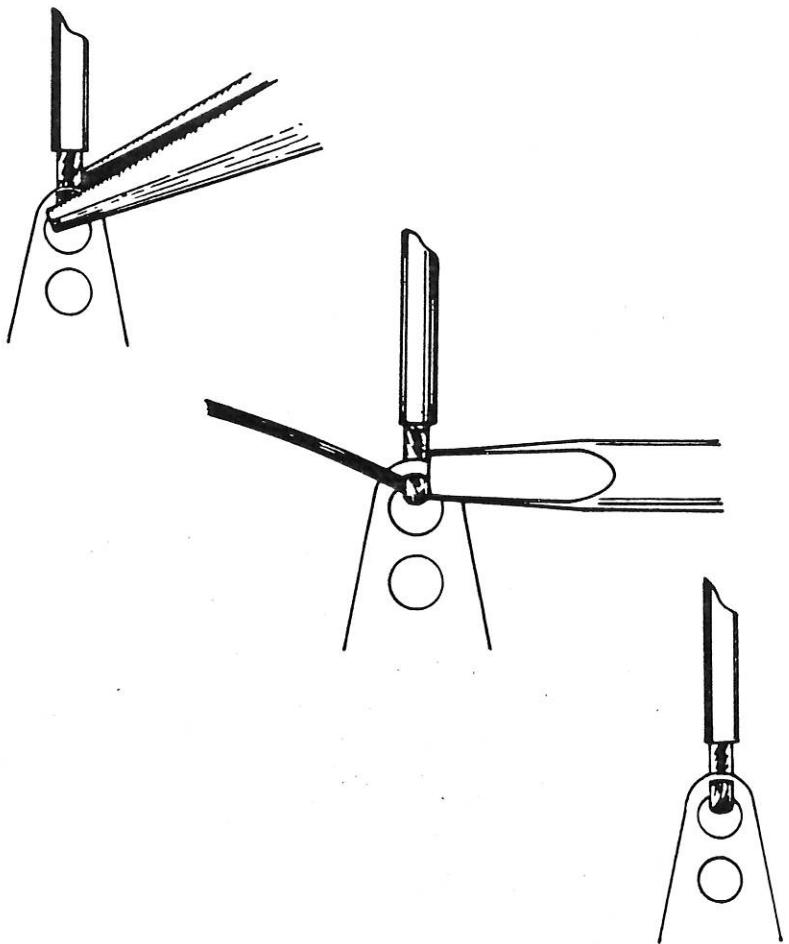
**NOTES**



# **Wiring & Soldering**

## **Handbook**

### **PIERCED TERMINALS**



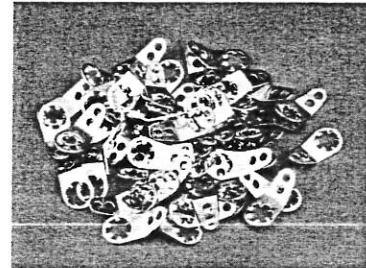
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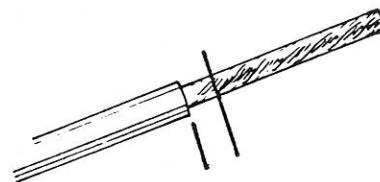


## WIRING & SOLDERING PIERCED TERMINALS

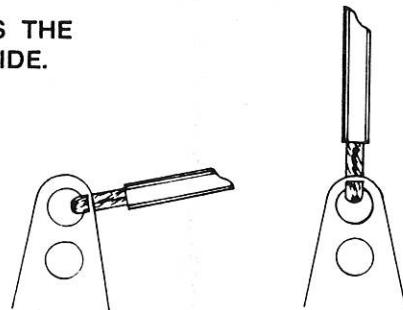
ASSORTMENT OF  
PIERCED TERMINALS



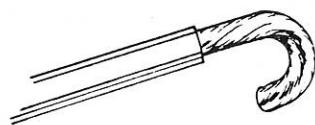
SELECT A WIRE WHICH HAS BEEN  
PROPERLY STRIPPED, TWISTED, AND  
TINNED.



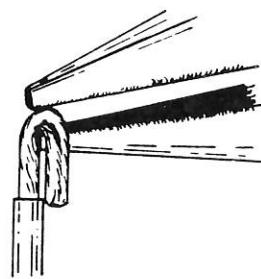
WHEN THE WIRE APPROACHES THE  
TERMINAL FROM THE TOP OR SIDE.



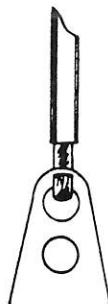
PREFORM THE WIRE TO A HOOK  
CONFIGURATION.



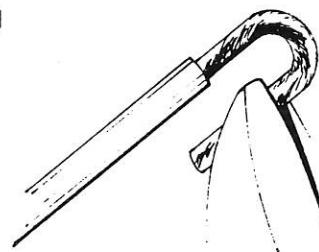
SHAPE THE WIRE AROUND THE BLADES OF ROUND NOSE PLIERS. DO NOT DAMAGE THE WIRE STRANDS DURING THE OPERATION.



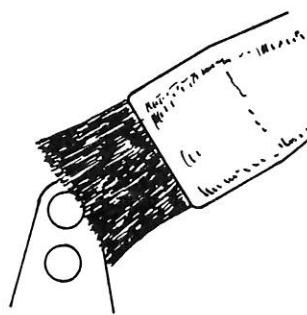
ALLOW FOR PROPER INSULATION CLEARANCE OF 1 TO 1½ INSULATION DIAMETERS. THIS PREVENTS INSULATIONS FROM MELTING INTO THE CONNECTION OR ADJACENT BARE WIRES FROM SHORTING.



CUT OFF EXCESSIVE WIRE LENGTH WITH WIRE CUTTERS.



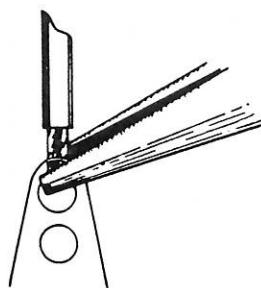
PRIOR TO INSTALLING THE WIRE, CLEAN THE TERMINAL WITH AN APPROVED SOLVENT AND BRISTLE BRUSH TO REMOVE CONTAMINATES DEPOSITED DURING STORAGE OR HANDLING.



PASS THE WIRE THROUGH THE EYE OF THE TERMINAL AND HOLD IN PLACE.



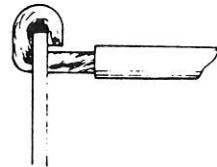
USING LONG NOSE PLIERS, GENTLY SQUEEZE WIRE TIGHTLY AGAINST THE TERMINAL. AVOID EXCESSIVE PRESSURE WHICH WOULD CAUSE DAMAGE TO WIRE STRANDS.



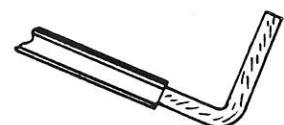
THE PROPER WRAP FOR A WIRE APPROACHING A PIERCED TERMINAL FROM THE TOP OR SIDE IS FOR THE WIRE TO BE CONTACTING THREE SURFACES OF THE TERMINAL.



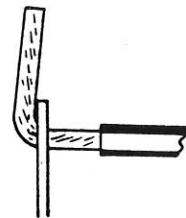
WHEN THE WIRE APPROACHES THE TERMINAL FROM THE FRONT OR REAR.



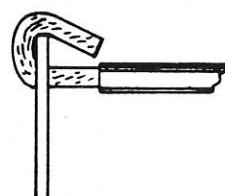
**PREFORM THE WIRE INTO AN "L" CONFIGURATION. BE CERTAIN TO BEND WIRE AT PROPER LOCATION TO MAINTAIN REQUIRED INSULATION CLEARANCE.**



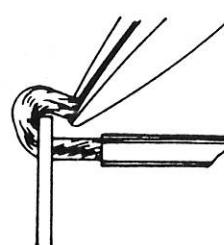
**INSERT THE WIRE THROUGH THE EYE OF THE CLEAN TERMINAL.**



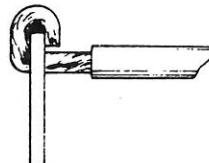
**GRASP THE END OF THE WIRE WITH LONG NOSE PLIERS. WRAP WIRE OVER TOP OR SIDE OF THE TERMINAL WITH THE END OF WIRE ANGLED DOWNWARD.**



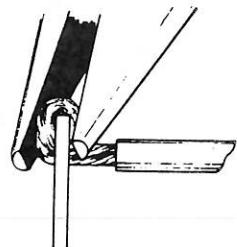
**CUT OFF EXCESSIVE WIRE WITH WIRE CUTTERS, ALLOWING ENOUGH WIRE FOR A PROPER WRAP AROUND THE TERMINAL.**



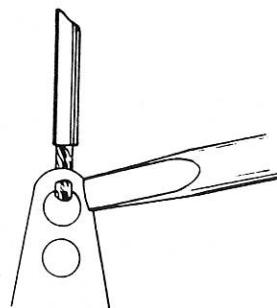
THE PROPER WRAP FOR A WIRE APPROACHING A PIERCED TERMINAL FROM THE FRONT OR REAR IS FOR THE WIRE TO BE CONTACTING ALL FOUR SURFACES OF THE TERMINAL.



TO ACHIEVE A TIGHT WRAP, GENTLY SQUEEZE THE LOOSE END OF WIRE FIRMLY TO TERMINAL USING LONG NOSE PLIERS. AVOID EXCESSIVE PRESSURE WHICH COULD CAUSE DAMAGE TO WIRE STRANDS.



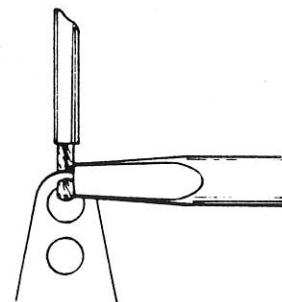
WITH WIRE OR WIRES PROPERLY IN POSITION, THE CONNECTION IS READY TO BE SOLDERED. TO SOLDER SAFELY AND QUICKLY, SELECT A SOLDERING IRON TIP THAT MATCHES THE CONNECTION TO BE SOLDERED.



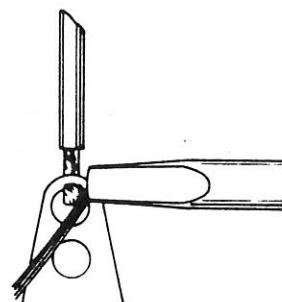
REMOVE THE SOLDERING IRON FROM THE HOLDER AND WIPE THE TIP ON A CLEAN, WET, CELLULOSE SPONGE.



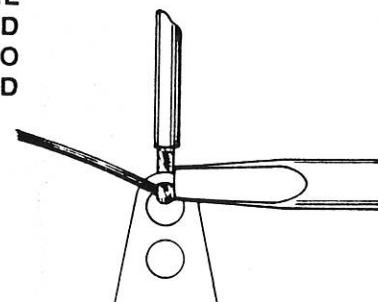
PLACE THE TIP ON THE CONNECTION  
WITH MAXIMUM CONTACT TO  
ACHIEVE A RAPID HEAT TRANSFER.



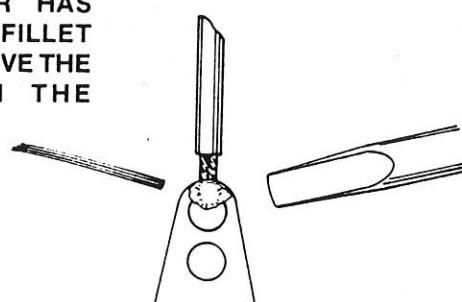
MELT A SMALL AMOUNT OF SOLDER  
AT THE JUNCTION OF THE TIP AND  
THE WORK TO FORM A SOLDER  
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RAPID HEAT TRANSFER.



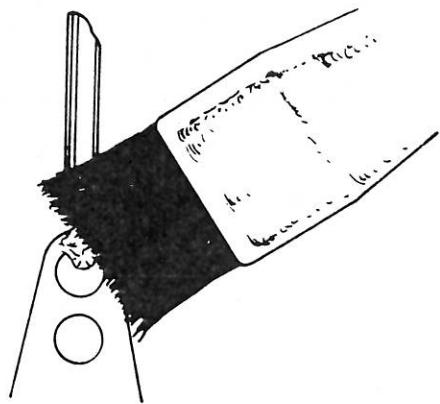
THEN IMMEDIATELY PLACE THE  
SOLDER OPPOSITE THE TIP AND  
ALLOW THE HEAT FROM THE TIP TO  
DRAW THE MOLTEN SOLDER AROUND  
THE TERMINAL.



AS SOON AS THE SOLDER HAS  
FORMED A CONTINUOUS FILLET  
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TERMINAL.

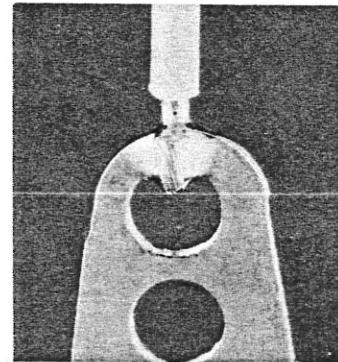


ALLOW THE CONNECTION TO SOLIDIFY AND COOL TO ROOM TEMPERATURE. REMOVE THE FLUX RESIDUE FROM THE TERMINAL WITH AN APPROVED SOLVENT AND BRISTLE BRUSH.



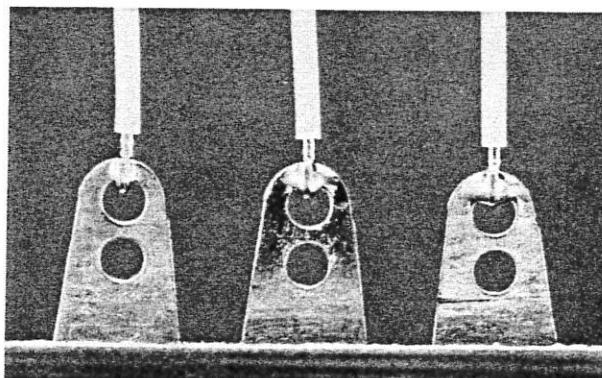
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THE COMPLETED CONNECTION SHOULD BE SMOOTH, BRIGHT, AND SHINY, WITH THE SOLDER FLOWING AND WETTING TO THE TERMINAL. THE WIRE STRANDS SHOULD BE READILY DISCERNIBLE BENEATH THE SOLDER.



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COMPANY MANUFACTURES.

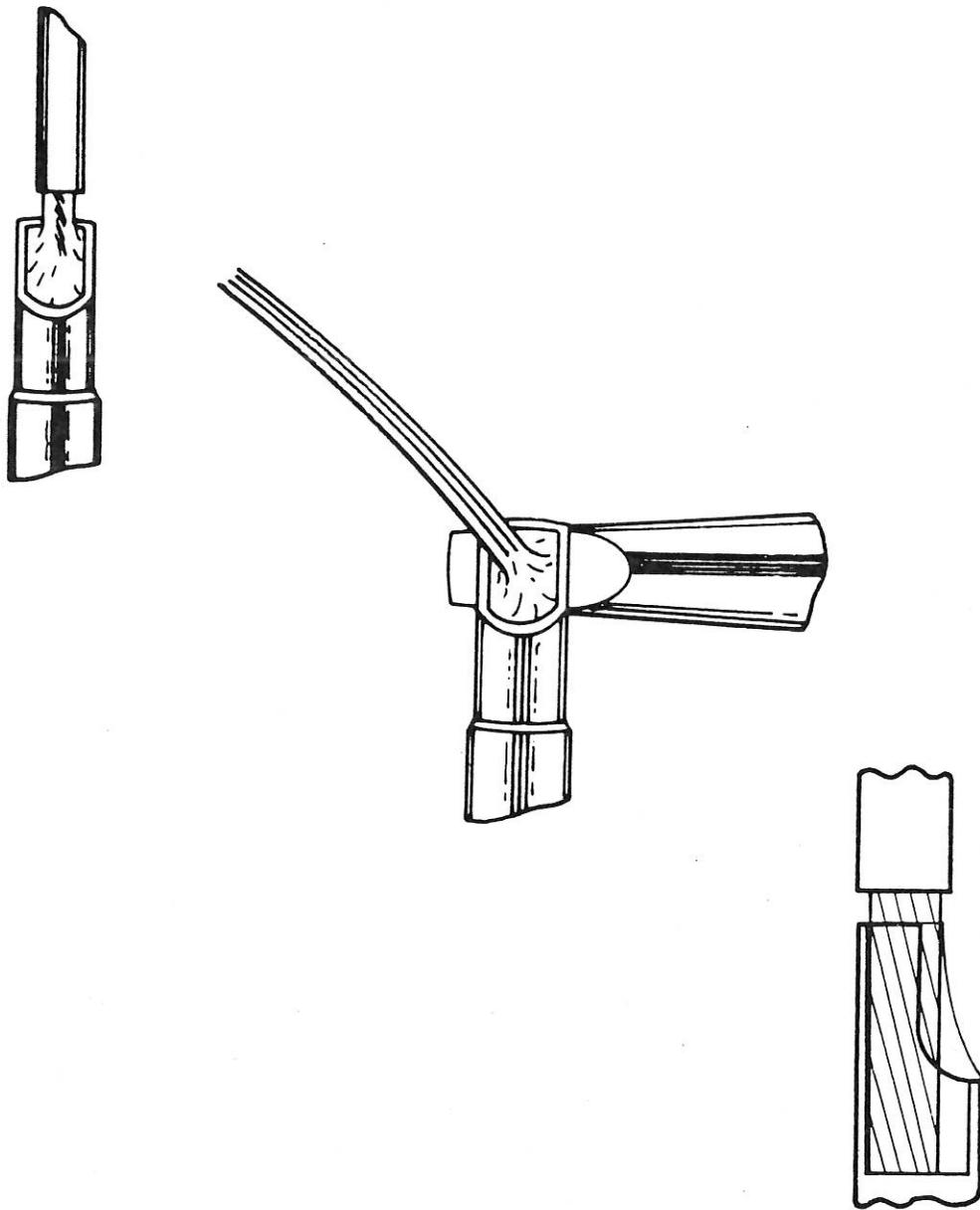
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**NOTES**

# **Wiring & Soldering**

## **Handbook**

### **CUP CONNECTORS**



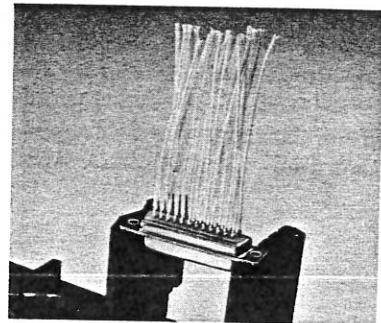
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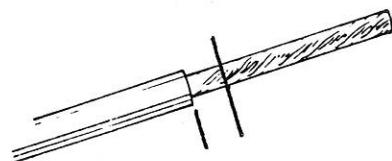


## WIRING & SOLDERING CUP CONNECTORS

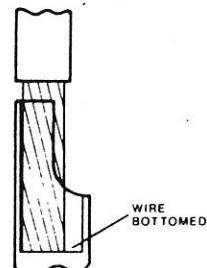
### WIRED CONNECTOR ASSEMBLY



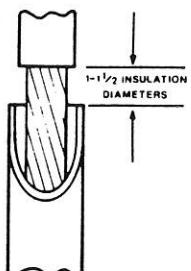
SELECT A WIRE WHICH HAS BEEN  
PROPERLY STRIPPED, TWISTED AND  
TINNED.



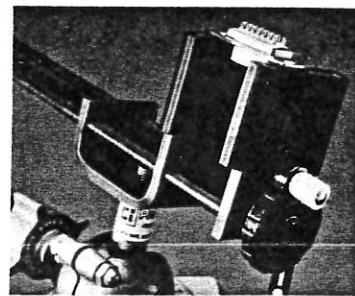
THE PROPER STRIP LENGTH PERMITS  
THE WIRE TO BE BOTTOMED IN THE  
CUP, ACHIEVING MAXIMUM CONTACT  
BETWEEN THE WIRE AND CUP.



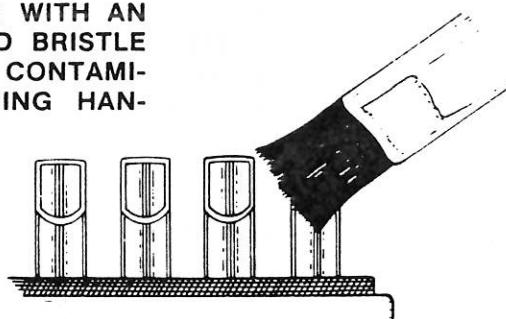
THE STRIP LENGTH SHOULD RESULT  
IN AN INSULATION CLEARANCE  
ABOVE THE TOP OF THE CUP  
RANGING FROM 1 TO 1½ TIMES THE  
INSULATION DIAMETER.



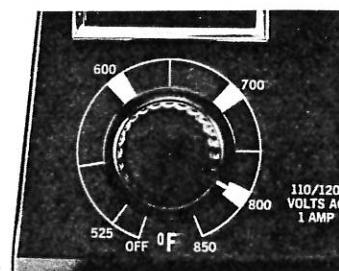
PLACE THE CONNECTOR INTO A VISE OR FIXTURE ADJUSTED TO AN ANGLE OF APPROXIMATELY 35 DEGREES. THIS HELPS PREVENT AIR OR GAS FROM BECOMING ENTRAPPED INSIDE THE CUP WHEN SOLDERING.



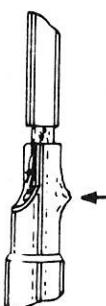
CLEAN THE CONNECTOR WITH AN APPROVED SOLVENT AND BRISTLE BRUSH TO REMOVE ANY CONTAMINANTS DEPOSITED DURING HANDLING OR STORAGE.



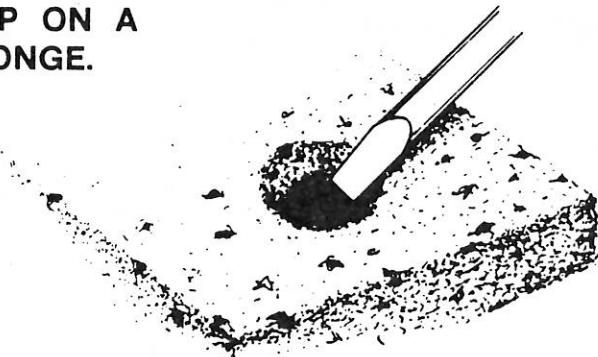
THE CORRECT SOLDERING TEMPERATURE FOR CUPS IS 750° TO 850° F. THIS HIGH TEMPERATURE IS REQUIRED TO HEAT THE CONNECTION QUICKLY BECAUSE A DRY SOLDERING IRON TIP MUST BE USED.



THE USE OF A DRY TIP PREVENTS EXCESSIVE SOLDER ON THE OUTSIDE OF THE CUP. EXCESS SOLDER COULD CAUSE SHORTING BETWEEN ADJACENT CUPS BECAUSE OF REDUCED CLEARANCE.

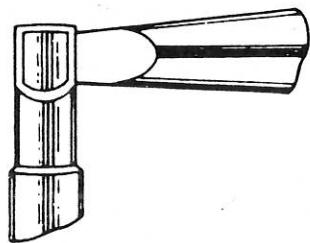


REMOVE THE SOLDERING IRON FROM HOLDER AND WIPE THE TIP ON A CLEAN, WET, CELLULOSE SPONGE.



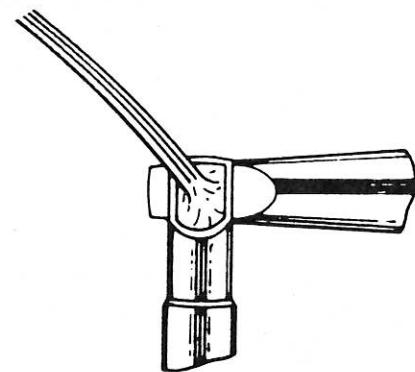
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PLACE THE TIP AGAINST THE SIDE OR REAR OF THE CUP, APPROXIMATELY 1/16" BELOW THE TOP. THIS TIP LOCATION PROVIDES MAXIMUM CONTACT TO ACHIEVE A RAPID HEAT TRANSFER.



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APPLY SOLDER TO THE INSIDE REAR WALL OF THE CUP AND ALLOW IT TO FLOW DOWN THE WALL. THIS FILLS THE CUP FROM THE BOTTOM UP, FORCING OUT ALL AIR AND GASES.

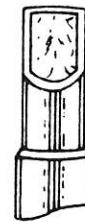


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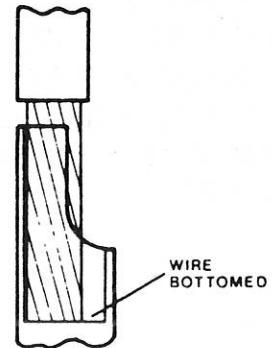
THIS HELPS PREVENT REJECTS SUCH AS AIR BUBBLES, VOIDS AND PIN HOLES IN THE SOLDER CONNECTION.



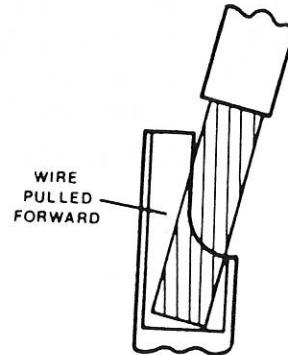
**FILL THE CUP WITH THE PROPER AMOUNT OF SOLDER.**



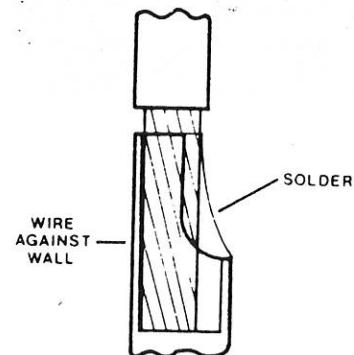
**WHILE KEEPING THE SOLDER MOLTEN, PICK UP A PREPARED WIRE AND INSERT IT COMPLETELY TO THE BOTTOM OF THE CUP. PUSH THE WIRE TO THE REAR OF THE CUP,**



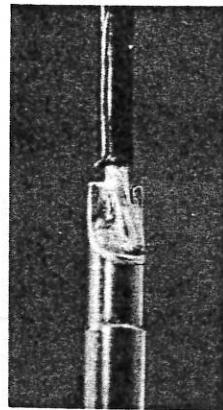
**GENTLY PULL THE WIRE FORWARD.**



**THEN PUSH IT AGAINST THE REAR WALL. THIS ROCKING MOTION HELPS ELIMINATE ANY POSSIBILITY OF AIR ENTRAPMENT.**

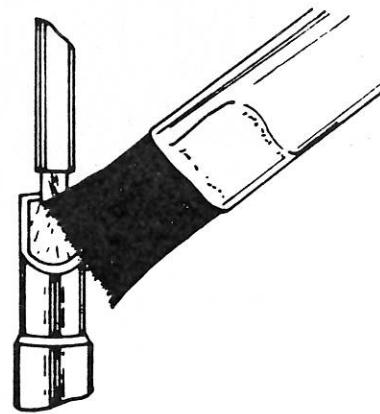


REMOVE THE TIP FROM THE CONNECTION. HOLD THE WIRE MOTIONLESS UNTIL THE SOLDER HAS COMPLETELY SOLIDIFIED. THIS PREVENTS DISTURBING THE CONNECTION.



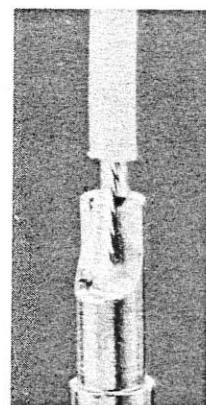
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ALLOW THE CONNECTION TO COOL TO ROOM TEMPERATURE. REMOVE THE FLUX RESIDUE FROM THE CUP WITH AN APPROVED SOLVENT AND BRISTLE BRUSH.

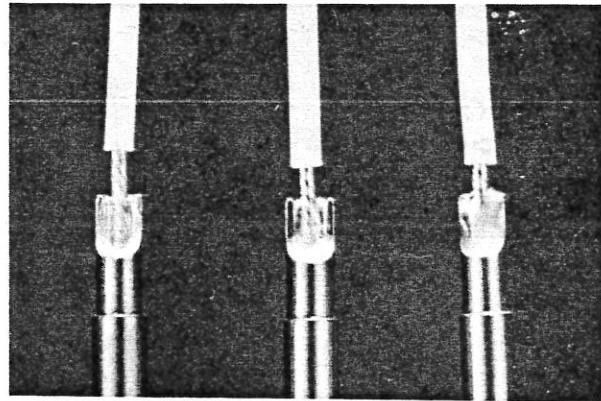


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THE COMPLETED CONNECTION SHOULD BE SMOOTH AND SHINY WITH NO VOIDS, PITS OR AIR BUBBLES. THE WIRE WILL BE BOTTOMED IN THE CUP AND BE TOUCHING THE REAR WALL FOR ITS ENTIRE LENGTH.



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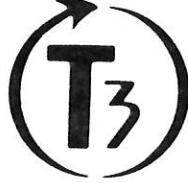
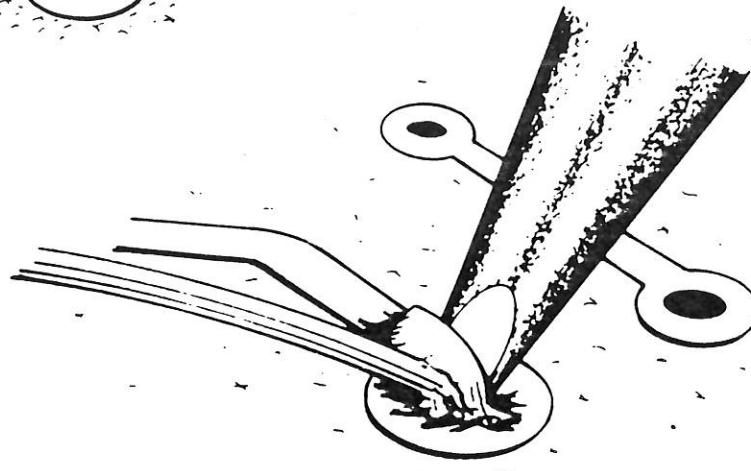
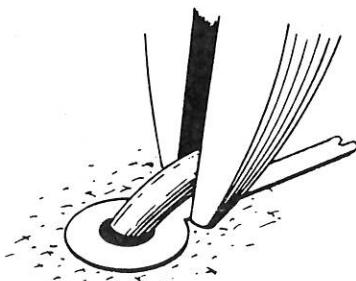


# **Wiring & Soldering Handbook**

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## **PRINTED WIRING BOARDS**

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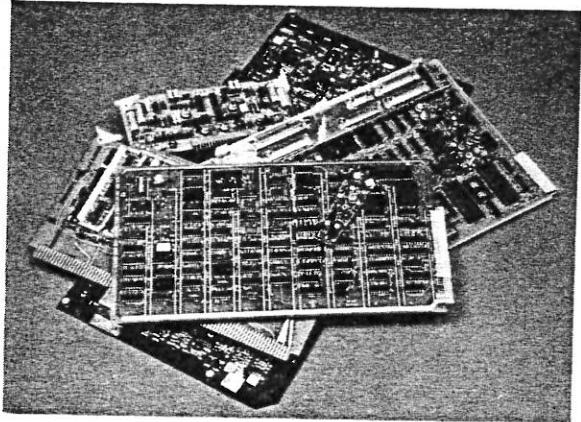
**OMNI TRAINING CORP**

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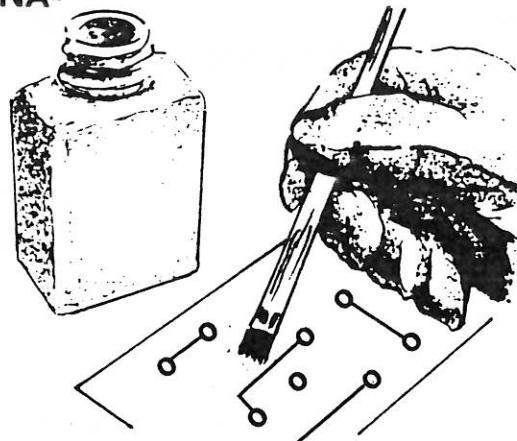
# WIRING & SOLDERING PRINTED WIRING BOARDS

ASSORTMENT OF  
PRINTED WIRING BOARDS



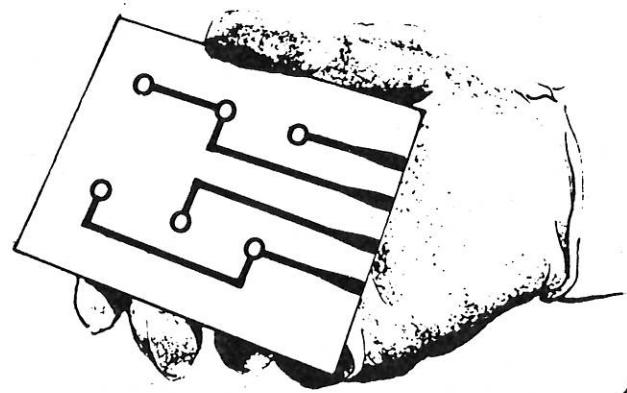
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PRIOR TO INSTALLING COMPONENTS  
ON PRINTED WIRING BOARDS, CLEAN  
THE BOARD WITH AN APPROVED SOL-  
VENT AND BRISTLE BRUSH TO  
REMOVE ANY SURFACE CONTAMINA-  
TION.

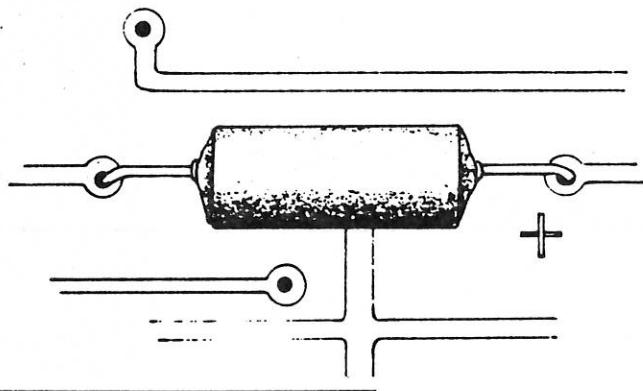


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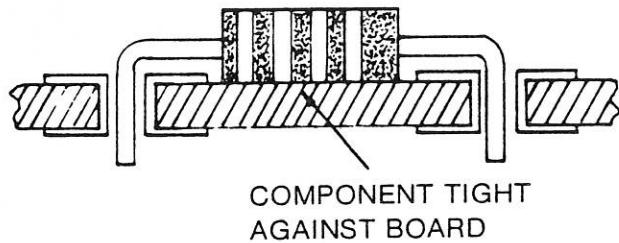
ONCE THE BOARD HAS BEEN  
CLEANED, DO NOT TOUCH ANY OF  
THE AREAS THAT ARE TO BE SOL-  
DERED. HANDLE THE BOARD BY ITS  
EDGES OR WEAR GLOVES OR FINGER  
COTS TO PREVENT ANY FURTHER  
CONTAMINATION.



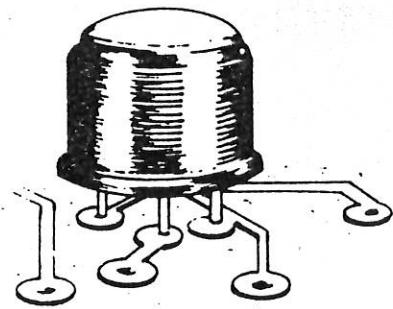
PLACE THE CLEANED BOARD INTO A BENCH VISE OR FIXTURE. SELECT A PROPERLY PREPARED COMPONENT AND INSERT IT INTO THE CORRECT HOLES IN THE BOARD OBSERVING POLARITY OR ACCEPTABLE MOUNTING TECHNIQUES.



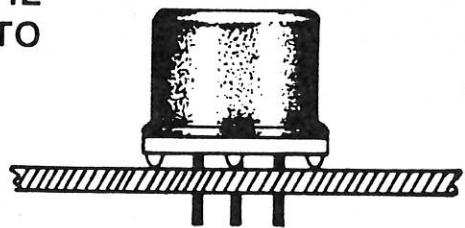
WHEN INSTALLING AXIAL LEAD COMPONENTS SUCH AS RESISTORS AND CAPACITORS, UNLESS OTHERWISE SPECIFIED, SEAT THEM TIGHTLY AGAINST THE BOARD TO PREVENT UNDUE STRESS TO THE COMPONENT OR SOLDER CONNECTION.



NON-AXIAL LEAD COMPONENTS SUCH AS TRANSISTORS MUST BE MOUNTED OFF THE BOARD AS THEIR METALLIC BODIES COULD SHORT OUT TO THE CIRCUITRY BELOW.

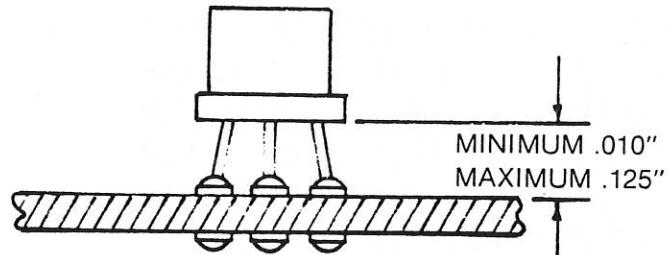


TRANSISTORS MAY BE INSTALLED USING A SEPARATE SPACER TO ELEVATE THE COMPONENT BODY. WHEN A SPACER IS USED, THE COMPONENT BODY MUST BE TIGHT TO THE SPACER, AND THE SPACER TIGHT TO THE BOARD.



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IF SPACERS ARE NOT USED, THE COMPONENT BODY SHOULD BE MOUNTED AT LEAST .010" MINIMUM TO A MAXIMUM OF .125" ABOVE THE BOARD.



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AFTER INSTALLATION, THE COMPONENT LEADS MUST BE PROPERLY TERMINATED. THE MOST COMMONLY USED TERMINATIONS ARE: CLINCHED STUD, AND LAP.

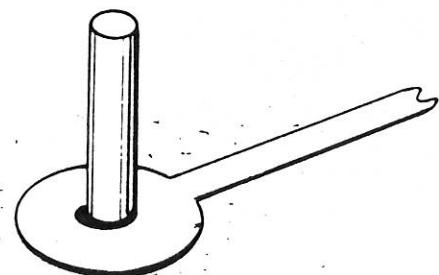
**CLINCH**

**STUD**

**LAP**

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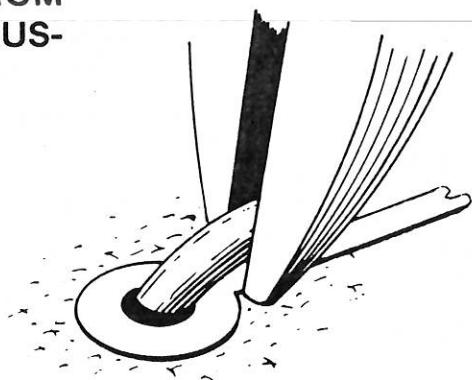
TO ACCOMPLISH PROPER LEAD CLINCHING, INSERT THE COMPONENT LEAD THROUGH THE HOLE.



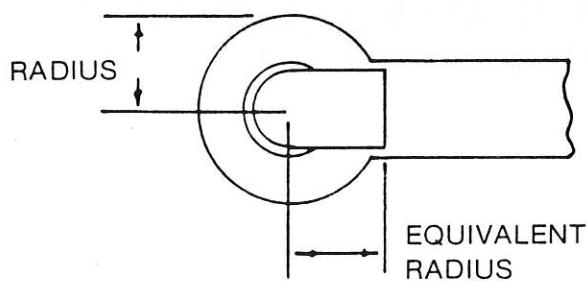
BEND THE LEAD OVER PARTIALLY, USING A NON-METALLIC SOLDERING AID. WHEN THERE IS A CIRCUITRY ATTACHED TO THE PAD, THE LEAD SHOULD ALWAYS BE BENT IN THE DIRECTION OF THE CIRCUITRY.



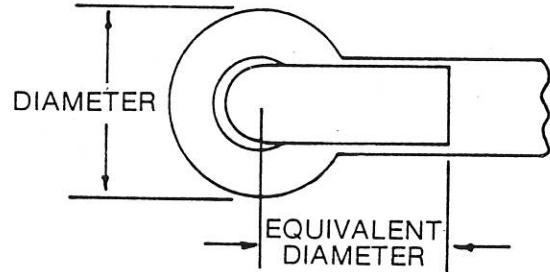
CUT OFF THE EXCESSIVE LEAD LENGTH, MAINTAINING CLINCH LENGTH REQUIREMENTS. CAREFULLY PREVENT THE CUTTER TIPS FROM CONTACTING THE BOARD AND CAUSING BOARD SURFACE DAMAGE.



AFTER CLINCHING, THE SHORTEST THE LEAD SHOULD BE IS TO THE EDGE (RADIUS) OF THE PAD.

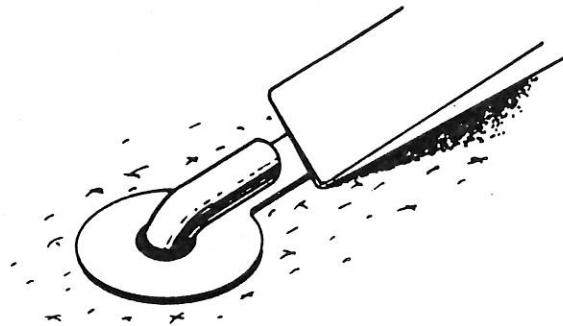


MAXIMUM LEAD LENGTH IS EQUAL TO THE DIAMETER OF THE PAD. DIAMETER IS THE MAXIMUM WIDTH OF THE PAD. THIS DISTANCE IS THEN MEASURED FROM THE CENTER OF THE HOLE IN THE DIRECTION OF THE ATTACHED CIRCUITRY TO DETERMINE MAXIMUM CLINCH LENGTH.



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COMPLETE THE CLINCHING OPERATION USING A NON-METALLIC SOLDERING AID, INSURING LEAD IS PRESSED DOWN TIGHTLY TO THE PAD OR ATTACHED CIRCUITRY.



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THE LEAD SHOULD REMAIN OVER THE PAD OR ATTACHED CIRCUITRY AND NEVER EXTEND OVER THE BOARD ITSELF, AS THIS WOULD REDUCE CLEARANCE BETWEEN METALLIC, CURRENT CARRYING PARTS POSSIBLY CAUSING SHORTING BETWEEN ADJACENT CIRCUITRY.

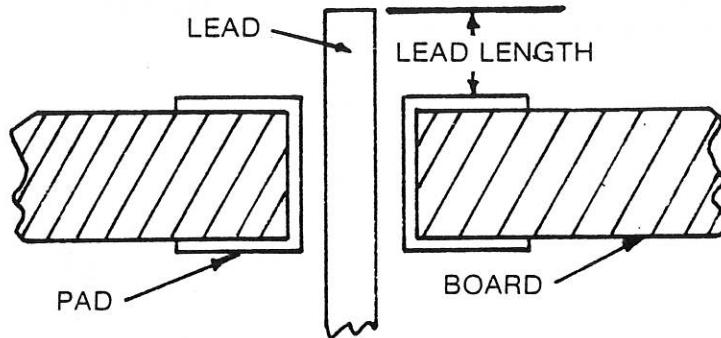


STUD TERMINATED LEADS EXTEND STRAIGHT THROUGH THE HOLE IN THE BOARD WITHOUT BEING BENT AND ARE USED PRIMARILY ON DOUBLE SIDED BOARDS HAVING PLATED THROUGH HOLES.



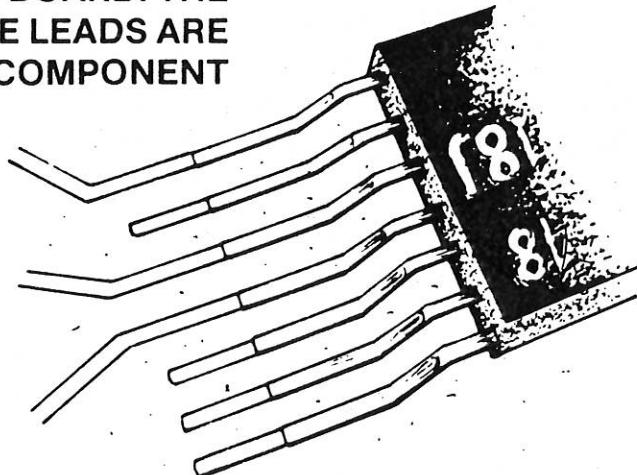
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ONCE THE LEAD IS INSERTED INTO THE BOARD, CUT IT TO THE PROPER LENGTH WHICH IS 1/32" MINIMUM TO A MAXIMUM OF 1/16".

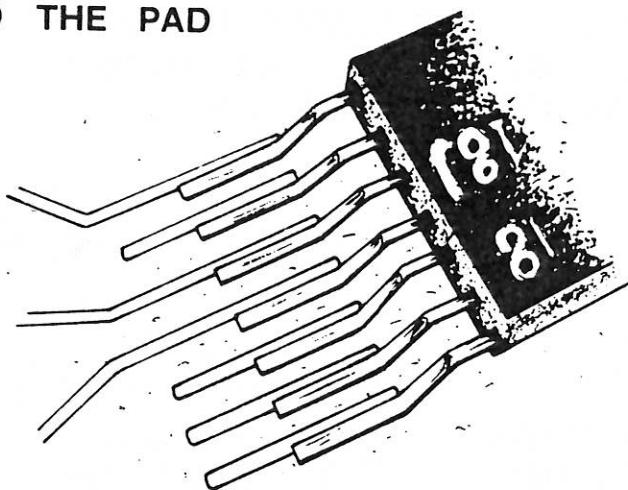


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THE LEADS OF LAP TERMINATED COMPONENTS ARE NOT INSERTED THROUGH HOLES IN THE BOARD. THE CIRCUITRY TO WHICH THE LEADS ARE ATTACHED IS ON THE COMPONENT SIDE OF THE BOARD.

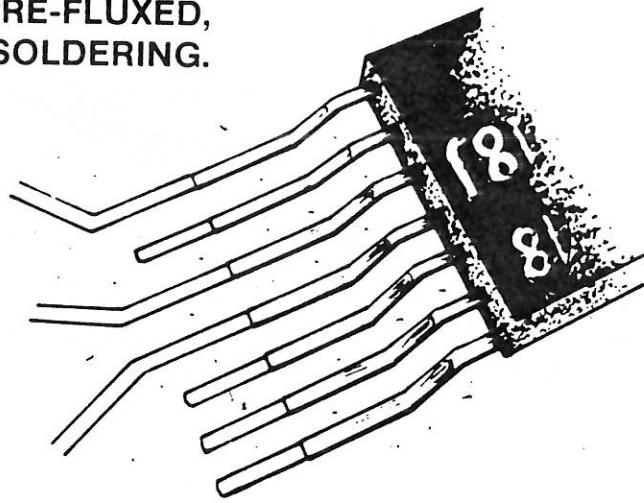


WHEN MOUNTING LAP TERMINATED  
COMPONENTS SUCH AS FLAT PACKS,  
BOTH THE LEADS AND THE PAD  
AREAS ARE PRE-TINNED.



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THE COMPONENT IS PROPERLY POSI-  
TIONED ON THE BOARD, PRE-FLUXED,  
AND HELD IN PLACE FOR SOLDERING.

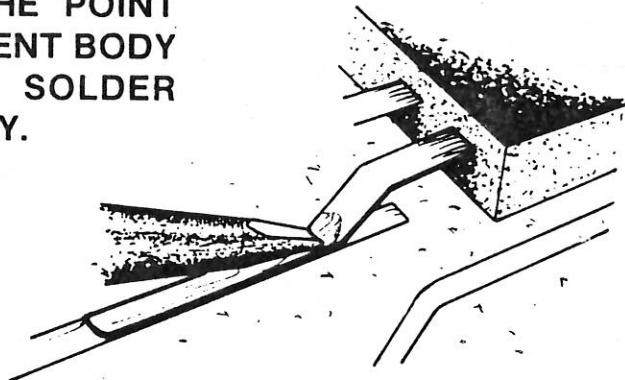


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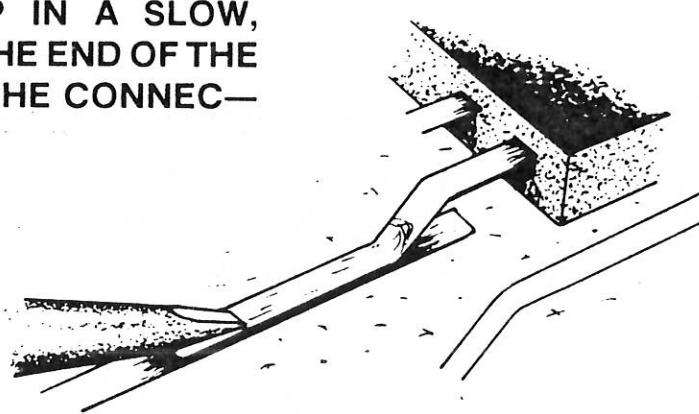
REMOVE THE SOLDERING IRON FROM  
HOLDER, AND WIPE THE TIP ON A  
CLEAN, WET CELLULOSE SPONGE.



PLACE THE PROPERLY SIZED TIP ON TOP OF THE LEAD AT THE POINT CLOSEST TO THE COMPONENT BODY TO BE SOLDERED. THE SOLDER SHOULD MELT IMMEDIATELY.



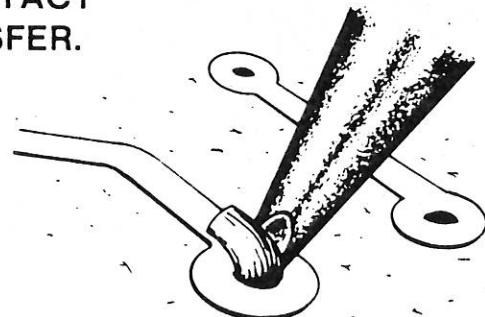
THEN, DRAW THE TIP IN A SLOW, SMOOTH MOTION TO THE END OF THE LEAD AND THEN OFF THE CONNECTION.



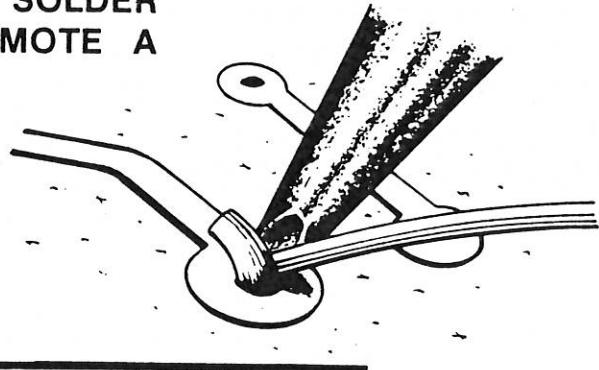
TO SOLDER CLINCHED AND STUD TERMINATIONS, WIPE THE TIP ON A CLEAN, WET, CELLULOSE SPONGE.



PLACE THE TIP AGAINST THE PAD AND THE LEAD WITH MAXIMUM CONTACT TO ACHIEVE RAPID HEAT TRANSFER.



MELT A SMALL AMOUNT OF SOLDER AT THE JUNCTION OF THE TIP AND THE WORK TO FORM A SOLDER BRIDGE WHICH WILL PROMOTE A RAPID HEAT TRANSFER.



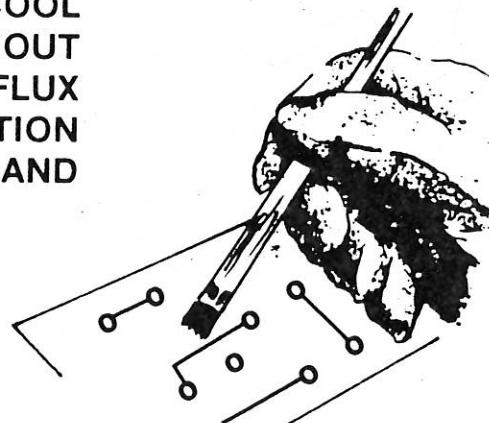
IMMEDIATELY MOVE THE SOLDER TO THE SIDE OF THE LEAD OPPOSITE THE TIP AND APPLY THE PROPER AMOUNT OF SOLDER. ALLOW THE HAT OF THE TIP TO DRAW THE MOLTEN SOLDER TOWARD THE TIP, AND FLOW THROUGHOUT THE CONNECTION. BE CERTAIN TO COVER THE BARE END OF THE WIRE WITH SOLDER.



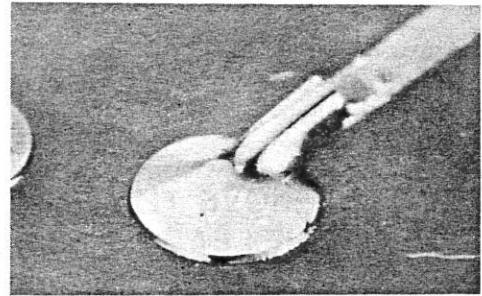
REMOVE THE TIP FROM THE CONNECTION. THE TIP SHOULD NEVER CONTACT THE WORK MORE THAN ONE TO THREE SECONDS TO PREVENT THE POSSIBILITY OF OVERHEATED CONNECTIONS OR BOARD DAMAGE.



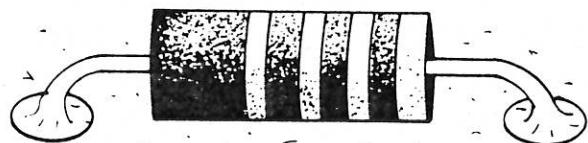
ALLOW THE CONNECTION TO COOL TO ROOM TEMPERATURE WITHOUT DISTURBING IT. REMOVE THE FLUX RESIDUE FROM THE CONNECTION USING AN APPROVED SOLVENT AND BRISTLE BRUSH.



THE FINISHED SOLDER CONNECTION SHOULD BE SMOOTH, BRIGHT AND SHINY. THE SOLDER SHOULD COVER THE ENTIRE LEAD AND THE LEAD SHOULD BE DISCERNIBLE BENEATH THE SOLDER. THE SOLDER SHOULD FORM CONCAVE FILLETS WHICH FEATHER DOWN TO THE EDGE OF THE PAD.



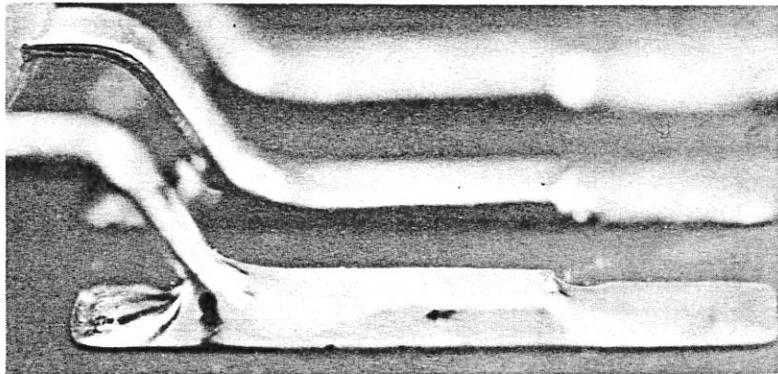
ON THE TOP SIDE OF THE BOARD, THE SOLDER SHOULD FORM A SLIGHT FILLET ABOVE THE BOARD SURFACE. DO NOT FILL THE BEND RADIUS WITH SOLDER. THIS WOULD RESULT IN LOSS OF REQUIRED COMPONENT LEAD STRESS RELIEF.



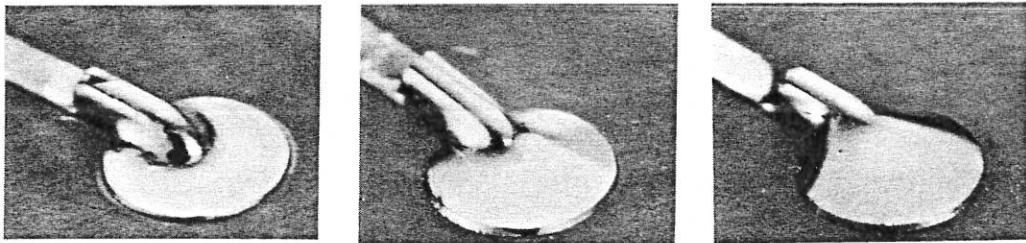
BY FOLLOWING THESE STEP BY STEP INSTRUCTIONS YOU SHOULD BE ABLE TO PRODUCE ACCEPTABLE SOLDER CONNECTIONS.

INSPECTION CRITERIA HAS BEEN PROVIDED WHICH ALLOWS YOU TO COMPARE YOUR WORKMANSHIP WITH INDUSTRY STANDARDS.

THIS LAP CONNECTION SHOWS THE  
OPTIMUM AMOUNT OF SOLDER.



THE CLINCHED CONNECTION ON THE  
LEFT SHOWS MINIMUM SOLDER, CEN-  
TER CONNECTION HAS THE OPTIMUM  
AMOUNT AND RIGHT CONNECTION  
HAS THE MAXIMUM AMOUNT.



THE STUD CONNECTION ON THE LEFT  
SHOWS MINIMUM SOLDER, CENTER  
CONNECTION HAS THE OPTIMUM  
AMOUNT AND THE RIGHT CONNE-  
CTION HAS THE MAXIMUM AMOUNT.



YOUR DEDICATION TO QUALITY  
WORKMANSHIP REFLECTS THE  
QUALITY OF THE PRODUCTS YOUR  
COMPANY MANUFACTURES.

# NOTES

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